Ontario Job Futures 2000

Ontario Canada

Inquiries at:

Economic Analysis and Information Directorate
Human Resources Development Canada, Ontario Region
(416) 954-6135

Ministry of Training, Colleges and Universities
Training Hotline (416) 326-5656
Toll Free 1-800-387-5656

ISBN 0-7794-0021-6

Cette publication est disponible en français sous le nom de:

Emploi-avenir Ontario 2000
août 2000

www.ontariojobfutures.net

101-01715/

Acknowledgements

Ontario Job Futures 2000 is a cooperative effort by the Ontario Ministry of Training, Colleges and Universities and Human Resources Development Canada, Ontario Region.

A number of sources were used to develop this publication. The analysis and projections of industry and occupational trends in Ontario were developed jointly by the Labour Market Information and Research group of the Ministry of Training, Colleges and Universities and the Economic Analysis and Information Directorate of HRDC. Identifying appropriate Web Links for more information was also a joint effort. The Economic Analysis and Information Directorate contributed data and information on the characteristics of occupations, while the Labour Market Information and Research group collated the manuscript for publication.

The two governments appreciate the valuable advice provided by members of the counselling and guidance community prior to the preparation of *Ontario Job Futures 2000*. Much of their input will be reflected further in the development of the Internet version of this publication.

Table of Contents

Introduction 1

Overview of Ontario's Employment Patterns 3

Occupational Profiles: What Information Is Provided by Each Profile? 15

Profiles for Selected Occupations

Management

0111 Financial Managers 20
0112 Human Resources Managers 22
0113 Purchasing Managers 24
0121 Insurance, Real Estate and Financial Brokerage Managers 26
0122 Banking, Credit and Other Investment Managers 28
0213 Information Systems and Data Processing Managers 30
0311 Managers in Health Care 32
0611 Sales, Marketing and Advertising Managers 34
0621 Retail Trade Managers 36
0631 Restaurant and Food Service Managers 38
0711 Construction Managers 40
0712 Residential Home Builders and Renovators 42
0911 Manufacturing Managers 44

Business, Finance and Administration

1111 Financial Auditors and Accountants 46
1112 Financial and Investment Analysts 48
1113 Securities Agents, Investment Dealers and Traders 50
1121 Specialists in Human Resources 52
1221 Administrative Officers 54
1222 Executive Assistants 56
1224 Property Administrators 58
1225 Purchasing Agents and Officers 60
1231 Bookkeepers 62
1233 Insurance Adjusters and Claims Examiners 64
1234 Insurance Underwriters 66
1241 Secretaries (Except Legal and Medical) 68
1242 Legal Secretaries 70
1243 Medical Secretaries 72
1411 General Office Clerks 74
1414 Receptionists and Switchboard Operators 76
1421 Computer Operators 78

1431 Accounting and Related Clerks . . . 80
1433 Tellers, Financial Services . . . 82
1441 Administrative Clerks . . . 84
1453 Customer Service, Information and Related Clerks . . . 86
1471 Shippers and Receivers . . . 88
1473 Production Clerks . . . 90
1474 Purchasing and Inventory Clerks . . . 92

Natural and Applied Sciences

2112 Chemists . . . 94
2113 Geologists, Geochemists and Geophysicists . . . 96
2121 Biologists and Related Scientists . . . 98
2131 Civil Engineers . . . 100
2132 Mechanical Engineers . . . 102
2133 Electrical and Electronics Engineers . . . 104
2134 Chemical Engineers . . . 106
2141 Industrial and Manufacturing Engineers . . . 108
2146 Aerospace Engineers . . . 110
2147 Computer Engineers . . . 112
2151 Architects . . . 114
2153 Urban and Land Use Planners . . . 116
2161 Mathematicians, Statisticians and Actuaries . . . 118
2162 Computer Systems Analysts . . . 120
2163 Computer Programmers . . . 122
2211 Applied Chemical Technologists and Technicians . . . 124
2221 Biological Technologists and Technicians . . . 126
2223 Forestry Technologists and Technicians . . . 128
2230 Civil Engineering Technologists and Technicians and Construction Estimators . . . 130
2232 Mechanical Engineering Technologists and Technicians . . . 132
2233 Industrial Engineering and Manufacturing Technologists and Technicians . . . 134
2241 Electrical and Electronics Engineering Technologists and Technicians . . . 136
2242 Electronic Service Technicians (Household and Business Equipment) . . . 138
2243 Industrial Instrument Technicians and Mechanics . . . 140
2244 Aircraft Instrument, Electrical and Avionics Mechanics, Technicians and Inspectors . . . 142
2251 Architectural Technologists and Technicians . . . 144
2252 Industrial Designers . . . 146
2253 Drafting Technologists and Technicians . . . 148
2254 Survey Technologists and Technicians . . . 150
2271 Air Pilots, Flight Engineers and Flying Instructors . . . 152

Health

3111 Specialist Physicians . . . 154
3112 General Practitioners and Family Physicians . . . 156

3113 Dentists . . . 158
3114 Veterinarians . . . 160
3121 Optometrists . . . 162
3122 Chiropractors . . . 164
3131 Pharmacists . . . 166
3141 Audiologists and Speech-Language Pathologists . . . 168
3142 Physiotherapists . . . 170
3143 Occupational Therapists . . . 172
3152 Registered Nurses . . . 174
3211 Medical Laboratory Technologists and Pathologists' Assistants . . . 176
3212 Medical Laboratory Technicians . . . 178
3214 Respiratory Therapists and Clinical Perfusionists . . . 180
3215 Medical Radiation Technologists . . . 182
3233 Registered Practical Nurses . . . 184
3234 Ambulance Attendants and Other Paramedical Occupations . . . 186
3411 Dental Assistants . . . 188
3413 Nurse Aides and Orderlies . . . 190

Social Science, Education, Government Service and Religion

4112 Lawyers . . . 192
4141 Secondary School Teachers . . . 194
4142 Elementary School and Kindergarten Teachers . . . 196
4143 School and Guidance Counsellors . . . 198
4151 Psychologists . . . 200
4152 Social Workers . . . 202
4162 Economists and Economic Policy Researchers and Analysts . . . 204
4211 Paralegal and Related Occupations . . . 206
4212 Community and Social Service Workers . . . 208

Art, Culture, Recreation and Sport

5111 Librarians . . . 210
5121 Writers . . . 212
5122 Editors . . . 214
5123 Journalists . . . 216
5124 Professional Occupations in Public Relations and Communications . . . 218
5125 Translators, Terminologists and Interpreters . . . 220
5223 Graphic Arts Technicians . . . 222
5225 Audio and Video Recording Technicians . . . 224
5226 Other Technical Occupations in Motion Pictures, Broadcasting and the Performing Arts . . . 226
5241 Graphic Designers and Illustrating Artists . . . 228
5242 Interior Designers . . . 230

Sales and Service

6221 Technical Sales Specialists, Wholesale Trade . . . 232
6231 Insurance Agents and Brokers . . . 234
6232 Real Estate Agents and Salespersons . . . 236
6233 Retail and Wholesale Buyers . . . 238
6241 Chefs . . . 240
6242 Cooks . . . 242
6251 Butchers and Meat Cutters, Retail and Wholesale . . . 244
6252 Bakers . . . 246
6271 Hairstylists and Barbers . . . 248
6421 Retail Salespersons and Sales Clerks . . . 250
6431 Travel Counsellors . . . 252
6453 Food and Beverage Servers . . . 254
6470 Early Childhood Educators and Assistants . . . 256
6471 Visiting Homemakers, Housekeepers and Related Occupations . . . 258
6472 Elementary and Secondary School Teacher Assistants . . . 260

Trades, Transport and Equipment Operators

7231 Machinists and Machining and Tooling Inspectors . . . 262
7232 Tool and Die Makers . . . 264
7241 Electricians (Except Industrial and Power System) . . . 266
7242 Industrial Electricians . . . 268
7244 Electrical Power Line and Cable Workers . . . 270
7246 Telecommunications Installation and Repair Workers . . . 272
7251 Plumbers . . . 274
7252 Steamfitters, Pipefitters and Sprinkler System Installers . . . 276
7261 Sheet Metal Workers . . . 278
7271 Carpenters . . . 280
7272 Cabinetmakers . . . 282
7281 Bricklayers . . . 284
7311 Construction Millwrights and Industrial Mechanics (Except Textile) . . . 286
7312 Heavy-Duty Equipment Mechanics . . . 288
7313 Refrigeration and Air Conditioning Mechanics . . . 290
7315 Aircraft Mechanics and Aircraft Inspectors . . . 292
7321 Motor Vehicle Mechanics, Technicians and Mechanical Repairers . . . 294
7322 Motor Vehicle Body Repairers . . . 296
7332 Electric Appliance Servicers and Repairers . . . 298
7351 Stationary Engineers and Auxiliary Equipment Operators . . . 300
7371 Crane Operators . . . 302
7411 Truck Drivers . . . 304
7421 Heavy Equipment Operators (Except Crane) . . . 306

Primary Industry

8251 Farmers and Farm Managers 308
8254 Nursery and Greenhouse Operators and Managers 310
8255 Landscaping and Grounds Maintenance Contractors and Managers 312

Processing, Manufacturing and Utilities

9234 Papermaking and Coating Control Operators 314
9422 Plastics Processing Machine Operators 316
9451 Sewing Machine Operators 318
9481 Aircraft Assemblers and Aircraft Assembly Inspectors 320
9482 Motor Vehicle Assemblers, Inspectors and Testers 322
9483 Electronics Assemblers, Fabricators, Inspectors and Testers 324
9484 Assemblers and Inspectors, Electrical Appliance, Apparatus and Equipment Manufacturing 326

Manufacturing

9510 Welders and Soldering Machine Operators 328
9511 Machining Tool Operators 330
9514 Metalworking Machine Operators 332

Appendix A: How Jobs Get Defined 337
Appendix B: Useful Web Sites 347
Appendix C: Alphabetical Listing of Occupational Profiles 351

Introduction

Assisting students and persons in the labour force to assess career options has become a complex task in a complex economy. The job market is undergoing substantial changes due to restructuring in the economy and new technologies in the production of goods and services. The objective of *Ontario Job Futures 2000* is to assist career and vocational counsellors in their work by providing background information on major trends in the economy and labour market and a set of 157 occupational profiles. This information will also serve as source material for students and workers in doing research on labour market trends and occupational prospects.

Ontario Job Futures 2000 consists of the following sections:

Overview of Ontario's Employment Patterns

This section provides background information on industry and occupational trends in Ontario. The number and kinds of jobs in tomorrow's economy will depend on the interplay of economic, demographic, social and technological factors. Some occupations will grow much faster than the average rate of growth in total employment; others will decline in importance. Some jobs will emerge as a result of new technologies; others will disappear. As well, the nature of work in most occupations will undergo change. Understanding these trends and the interplay of the underlying factors will help in assessing career choices and paths.

The employment outlook part of this section provides information on the expected occupational employment growth in Ontario to the year 2005. Projections, of course, should be interpreted with caution. Shifts in the rate of economic growth, technological developments, business restructuring or changes in government policies can impact on the future growth prospects or skill requirements of the labour market.

Occupational Profiles

This section provides information on 157 occupations that have been selected partly because, historically, there has been high interest in them and because of their importance in Ontario's economy and labour market – together, employment for these selected occupations makes up a little over half of the total employment in Ontario. Miscellaneous groupings of occupations not elsewhere classified and general labour groups have been excluded, as the groupings are too diverse to permit meaningful analysis.

The profiles are organized according to the occupational groupings used in the National Occupational Classification (NOC) system. Each profile covers five elements:

Description

Describes the occupations, including a sampling of job titles commonly used to describe particular jobs within the occupational group and a list of typical employers.

Selected Main Duties

Describes the main duties usually carried out by workers in the occupational group.

Education/Training

Provides basic information about education and training requirements.

Employment Prospects

Provides information on the expected employment prospects in Ontario to 2005.

Characteristics of Occupation

Provides statistical information about total employment levels; the share of men and women in the occupation; full-time/part-time and self-employment levels; place of work; main industries of employment; employment by region; employment income. This information is specific to Ontario. Also, web site sources for more information in Ontario and other jurisdictions are provided.

Ontario Job Futures 2000 has been produced as a co-operative project by the Economic Analysis and Information Directorate of Human Resource Development Canada, Ontario Region and Labour Market Information and Research group of the Ministry of Training, Colleges and Universities.

The main sources of information used in developing this publication include the National Occupation Classification system[1], information on occupations collected by the Human Resources Development Canada, Ontario Region, as well as detailed analysis of the 1996 Census data. Projections of industry and occupational trends in Ontario were developed jointly by the Labour Market Information and Research group and the Economic Analysis and Information Directorate. The projections are consistent with the methodological framework of the National Occupational Projection System, used by HRDC's Applied Research Branch for national analysis, but deal specifically with Ontario statistics and trends. Provinces and Human Resources Development Canada, Regional Offices and National Headquarters, jointly developed the economic growth scenario used in the Ontario projection model.

It is hoped that *Ontario Job Futures 2000* is a useful reference tool that will enable users to become better acquainted with the Ontario labour market and occupational prospects. This publication is but one of the tools available for career planning and development purposes. Similar material is available for some other provinces as well as for the nation as a whole.

---

[1] *National Occupational Classification*, Catalogue No. MP53-25/1-1993E, Minister of Supply and Services Canada, 1993 (www.hrdc-drhc.gc.ca/noc).

Overview of Ontario's Employment Patterns

Introduction

Making career decisions is challenging. Making one that is "right" for you depends on finding the right information on things you need to know. On the one hand, you need to know which occupations would best suit your interests and aptitudes. On the other hand, you need information about such things as the nature of the job, future work opportunities, education and training expectations. Career choices can be especially challenging in today's fast-paced labour market where demand for different skills seems to change quickly, with new types of occupations appearing as quickly as others disappear. Understanding the labour market is an important step toward making "informed" choices.

The purpose of this overview is to provide background information on industry and occupational employment trends in Ontario. It starts with a brief description of the key factors that determine industry and occupational employment patterns over time.

First, we take a look at Ontario's employment characteristics by industry. Ontario has a diverse mix of industries, and each with a unique occupational make-up. As industries grow and change, there are corresponding changes in their occupational composition.

Next, we take a look at emerging and evolving occupations. Emerging occupations and changes in existing occupations have important implications for changing the skill and educational requirements of tomorrow's work place.

Finally, we look at expected future trends in the distribution of new job creation across industry sectors and by occupational groups to the year 2005.

In 1999, 5.7 million people were working in Ontario:

54% were male workers	46% were female workers
82% worked full-time	18% worked part-time
84% were employees	16% were self-employed

Source: Statistics Canada, Labour Force Survey.

Why do jobs change over time?

The Canadian Oxford dictionary defines "occupation" as being a "person's temporary or regular employment, a business, calling or pursuit". In 1999, an average of 5.7 million Ontarians were working in hundreds of different occupations – singers, web designers, engineers, teachers, technicians, plumbers, machinists or construction helpers, just to name a few. Whether working full or part-time, for a company or self-employed, the labour market offers a wide variety of career choices.

Over time, however, the types of jobs available to workers change, due to changes in the economy. Among the important factors influencing the demand for workers and the types of skills and occupations needed in the labour market are the following:

Economic growth

A growing economy means more people are working and have more money to spend. Companies respond to increased business activity by investing to expand further to meet customer demands. Increased international trade also contributes to economic growth. As a result, new jobs are created across a wide range of occupations.

Technology

Technological innovations in the production, distribution and sale of goods and services play a key role in both the types of jobs available and the skills that are needed. The increased use of computers in the workplace, for example, is increasing the demand for computer programmers and systems analysts but is reducing the demand for secretaries and clerks. Technological discoveries can create brand new occupations as well. For example, the growth of Internet use gave birth to the web page designer.

Demographics

Population characteristics, such as age, gender and cultural background, can determine the demand for various products and services. A younger population requires more schools and therefore more teachers; an older population requires more health services and therefore more doctors and nurses. As well, certain occupations have a greater proportion of older workers who may soon retire, creating vacancies.

Consumer behaviour

People's needs change over time, depending on how much money they have, their changing tastes and the amount of leisure time they have. For example, ecotourism is a relatively recent phenomenon. Developing and operating tourist attractions and accommodations has created many jobs in a large number of occupations such as hotel clerks, managers, tour guides and recreation consultants.

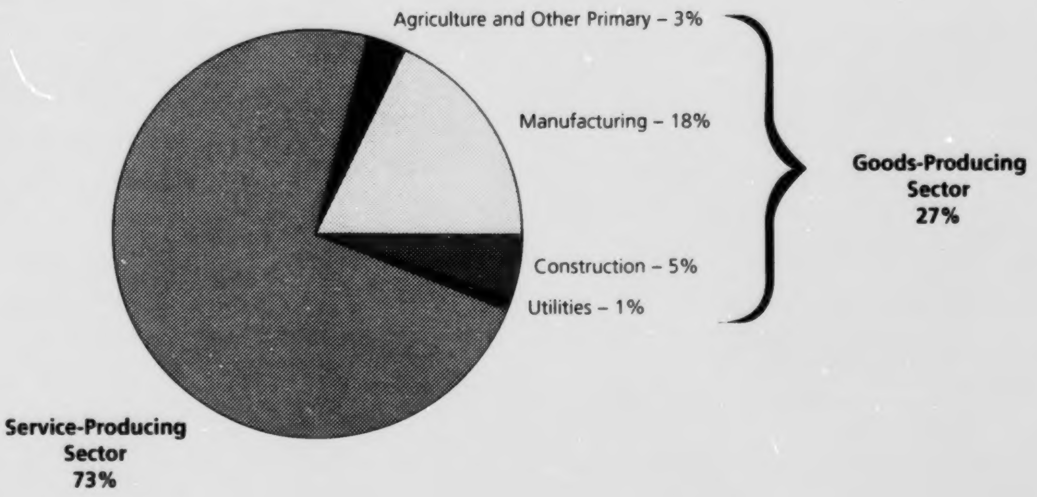
Where are today's jobs by industry sector?

As in most industrialized economies in the world, Ontario's economy has changed dramatically over the past 100 years. The economy has evolved from one based on primary industries to one dominated by manufacturing after World War II to one that today is driven by high technology manufacturing and services. Over the decades, the kinds of jobs available have undergone similar changes – away from occupations related to agriculture, forestry or mining to a wide variety of professional, technical and service occupations.

Goods are produced by agriculture and other primary industries, manufacturing, construction and utilities. Together these industries constitute the so called goods-producing sector. The service-producing sector provides the many different services demanded by today's consumers and businesses, including financial, educational, government and recreation. Figure 1 shows the percent share of employment in Ontario by industry sector for 1999.

Figure 1

Employment by Industry Sector in Ontario, 1999



Source: Statistics Canada, Labour Force Survey.

Since the number and the kinds of jobs available to workers depend on the goods and services produced in the economy, a closer look at manufacturing and service-producing industries – the two largest sources of jobs – follows.

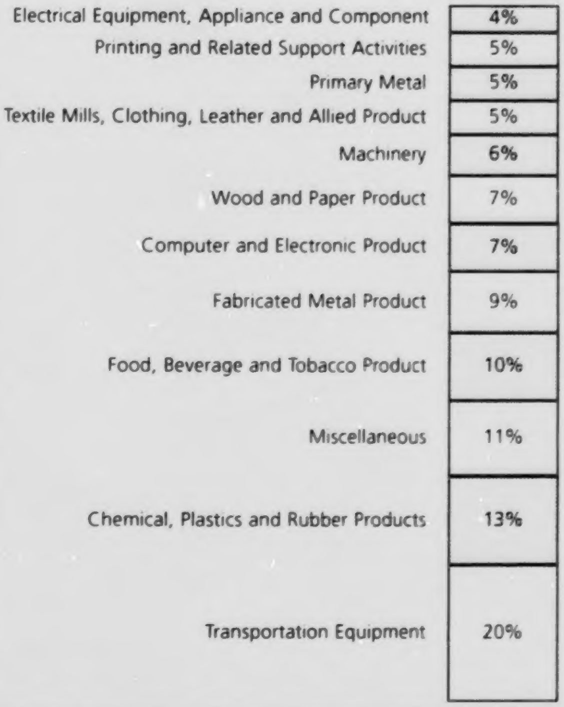
Manufacturing industries

Manufacturing industries have the largest share of employment in the goods-producing sector in Ontario, producing a variety of consumer and industrial products that are key to Ontario's wealth. The sector accounts for one fourth of all economic activity in the province, and about 70 percent of the sector's products are exported to other provinces and countries. In 1999, manufacturing employed over one million people in the province.

The transportation equipment industry is Ontario's largest manufacturing industry employing 20 percent of, or one in five, manufacturing workers (see Figure 2). In recent years, employment in this industry has expanded as Ontario's companies have increased production of autos and auto parts to meet the

Figure 2

Industry Share of Manufacturing Jobs*
Ontario, 1999



Note: May not add to 100% due to rounding.

* Grouped according to North American Industry Classification System (NAICS).

Source: Statistics Canada, Labour Force Survey.

demands of the U.S. market. The second largest industry is the chemical, plastics and rubber products industry employing 13 percent of manufacturing workers. The computer and electronics industry is the sixth largest with a share of 7 percent of manufacturing employment.

Manufacturing often tends to be concentrated in certain regions of the province. It is useful to know industry locations to identify the potential for career directions and job opportunities. For example, Sarnia and the surrounding area is home to much of the chemical, plastics and rubber industry. The computer and electronics industry is largely based in the Ottawa and Greater Toronto Area, while the auto industry is largely located around Toronto and in Southwestern Ontario. Steel and other primary metal production is heavily concentrated in Hamilton, Sault Ste. Marie and Sudbury. Food, beverage, textile and clothing manufacturers are located in many different communities in Southern Ontario.

Service-producing industries

The service-producing sector has been growing rapidly in recent years and employs nearly three quarters of Ontario workers. Service-producing industries have been the major employer for many years and cover a wide range of economic activity. Figure 3 shows each service industry's share of the 4.1 million service sector jobs in 1999.

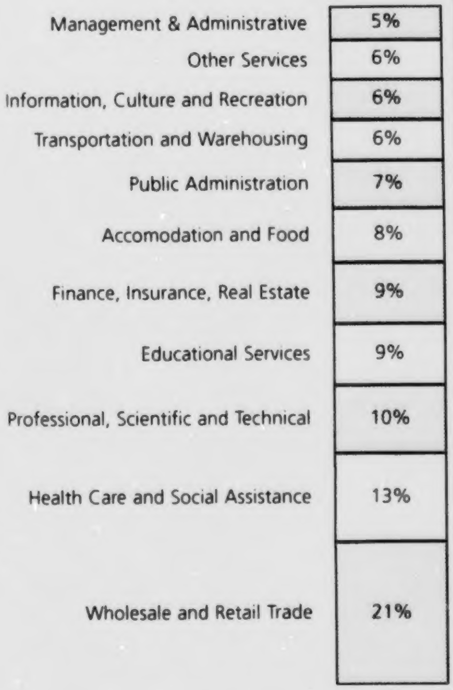
The four largest industries in this sector are wholesale and retail trade, health care and all kinds of social assistance, professional, scientific and technical services, and educational services. Together, they provide 53 percent, or a little over half, of all jobs in the service-producing sector.

In providing services to people, businesses and communities, job opportunities in the service industries can be particularly sensitive to changes in the demographic make-up of the population and consumer behaviour. Examples were already noted about the relationship between the school aged population and education, senior citizens and health care, and the growing popularity of travel. Technological innovations and advances also have a significant influence over job opportunities. Increased adoption of computer and communications technologies by businesses have resulted in many job opportunities in the professional, scientific and technical service fields.

Some service industries also tend to be more regionalized than others. For example, employment in finance, insurance, real estate and leasing is more concentrated in Toronto. The same holds true for professional, scientific and technical services, although this industry is also prevalent in the Ottawa area. Employment in public administration is concentrated in Ottawa. Employment in industries such as retail trade, however, is more evenly distributed around the province in proportion to population.

Figure 3

Industry Share of Service-producing Jobs*
Ontario, 1999



* Grouped according to the North American Industry Classification System (NAICS).

Source: Statistics Canada, Labour Force Survey.

In what industries do you find specific occupations?

Since the numbers and kinds of jobs available to workers depend on the goods and services produced by Ontario industries, each industry has a unique occupational profile. Figure 4 illustrates this occupational uniqueness for 1999. The largest share of employment in manufacturing industry is in occupations that are unique to processing, manufacturing and utilities. In the construction industry, trades, transport and equipment operators represent 75 percent of that industry's employment. In the primary industry 77 percent of employment is unique to that industry. To a lesser degree, these goods-producing industries also employ management, business, finance and administrative (including clerical), natural and applied science and sales and service occupations.

The service-producing industries have a diverse collection of occupations: 10 percent of their employment is in management occupations, 21 percent in business, finance and administrative occupations, and 31 percent in sales and service occupations. At the same time, all other occupational groups are represented to some degree in their employment ranks.

It should be noted that each occupational group shown in Figure 4 represents a collection of many jobs that have a similar function. For example, all jobs concerned with providing health care (regardless of educational or training requirements or complexity of the main duties) are grouped in health occupations.

Figure 4

Occupational Employment by Industry, Ontario, 1999

	Manufacturing Industry %	Service-producing Industry %	Construction Industry %	Primary* Industry %
All Occupations	**100**	**100**	**100**	**100**
Management	8	10	11	1
Business, Finance and Administrative	12	21	9	6
Natural and Applied Sciences	9	7	2	3
Health	0	7	0	0
Social Science, Education, Government Service and Religion	0	9	0	0
Art, Culture, Recreation and Sport	1	4	0	0
Sales and Service	4	31	1	2
Trades, Transport and Equipment Operators	16	9	75	7
Primary Industry	0	1	0	77
Processing, Manufacturing and Utilities	50	1	1	2

* Primary Industry includes Agriculture, Forestry, Fishing, Mining, Oil and Gas.

Source: Statistics Canada, Labour Force Survey.

What are the emerging occupations and industries?

No discussion on occupational trends would be complete without mentioning emerging and evolving occupations. Emerging occupations are those that require knowledge, skills and abilities not defined by occupations in current occupational coding structures (such as the National Occupational Classification[1] system in Canada). Basically, these are new occupations in the workforce – *new titles with new skills*. Examples include: webmaster, multimedia specialist, direct broadcast satellite technician, global positioning systems technician, and electronic commerce specialist[2].

Evolving occupations, on the other hand, are those already listed in current occupational coding structures, but ones in which the requisite knowledge, skills, and abilities of the occupation are changing significantly from those outlined in existing coding structures. Simply put, these are traditional occupations whose knowledge, skills and abilities have changed or evolved – *old titles with new skills*. Examples include computer programmer or digital imaging technician in the printing industry.

---

[1] For more information on Human Resources Development Canada's National Occupational Classification System, please visit the website at (www.hrdc-drhc.gc.ca/strapol/ia/prodserv/national.shtml).

[2] Emerging and Evolving Occupations in Texas, Texas State Occupational Information Co-ordination Committee (SOICC), 1999.

Human Resources Development Canada (HRDC) has been conducting sectoral and occupational studies for some time. To date, HRDC has researched the profiles of the following new and emerging industry sectors in the economy[3]:

- aerospace
- biotechnology in: agriculture; forestry; fishing; pharmaceuticals
- call centres
- environment
- gaming
- multimedia
- telehealth
- tele-learning

These new and emerging sectors will continue to rely on traditional occupations although the duties for many jobs may be broadened and will require additional skills. However, there will also be new or emerging jobs and occupations, though initially the employment levels for these are often small. The tele-learning sector provides an example of the mix of traditional and new occupations. Among the traditional occupations are teachers, curriculum developers, and librarians and all will require some additional computer and communications related skills; multimedia specialists are identified as the emerging occupation for this sector.

Internet usage is soaring around the world. As e-commerce for business-to-business and business-to-consumer transactions transforms key business and many retail processes, the occupational and skill-mix requirements will undergo changes for quite some time.

What are the educational and skill requirements for today's jobs?

The importance of a good basic education, and, increasingly, post-secondary education and training cannot be emphasized enough. There has been a dramatic increase in both the education level and the skills required for all occupations. While there are still a large number of low skill, entry-level occupations, many of them now have higher basic skill[4] requirements. As skill needs continue to increase, learning will not stop after leaving school but will continue during a person's whole career. The notion of *lifelong learning* as an integral part of one's life is gaining momentum.

With respect to education, Figure 5 clearly shows how educational requirements have increased over the last decade. The proportion of workers in Ontario with post-secondary qualifications increased in all occupational groups between 1990 and 1999.

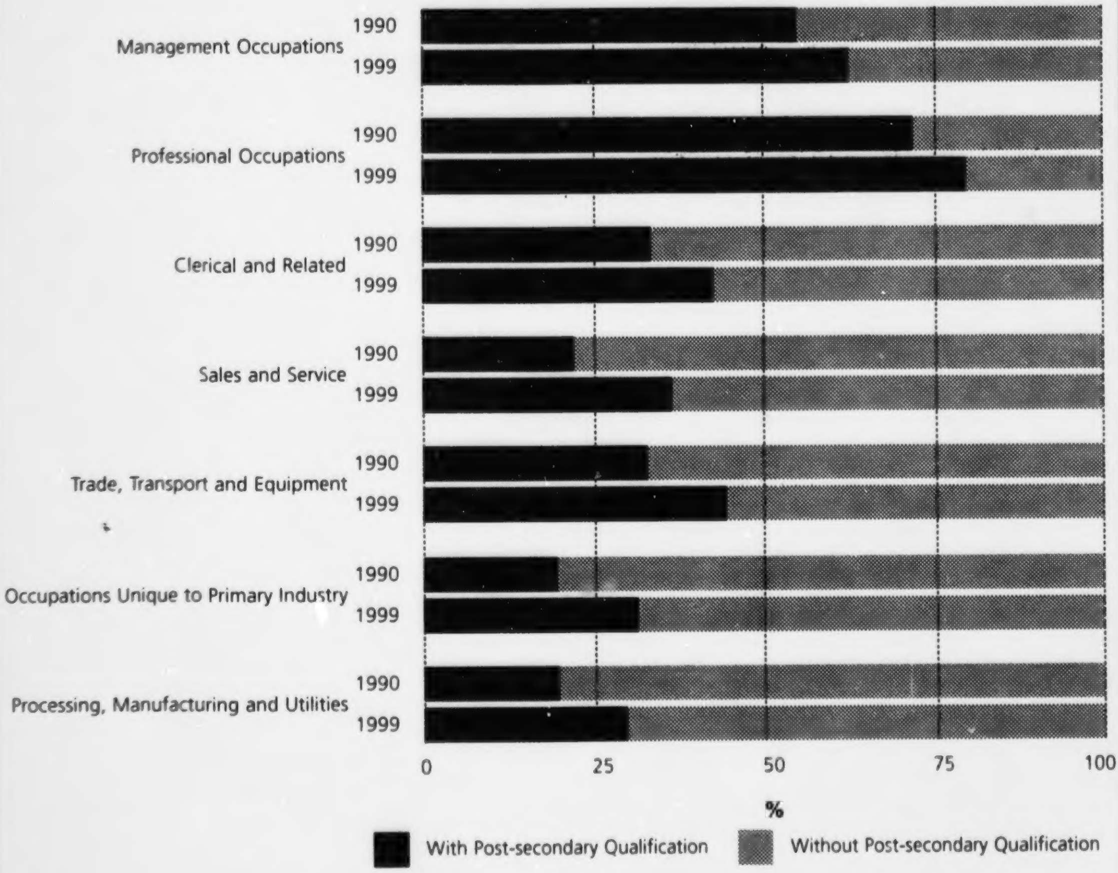
---

[3] Emerging Sectors (various studies), Sectoral and Occupational Studies Division, Human Resources Development Canada (http://www.hrdc-drhc.qc.ca).

[4] *The Essential Skills Profiles*, Standards, Planning and Analysis Division, Human Resources Development Canada, 1998 (http://www.hrdc-drhc.qc.ca).

Figure 5

Employment by Occupation and Educational Attainment Ontario, 1990 and 1999



Source: Statistics Canada, Labour Force Survey.

A relatively recent development, especially evident in new and evolving "high-tech" jobs, is the fusion of training, education and skills. For example, the job description for Internet specialist, according to a Minnesota Department of Economic Security study, combines technical know-how, problem solving and interacting with customers. In addition to software programming and producing and updating web pages for clients, the Internet specialist installs and fixes computer equipment and provides technical support to users through phone calls, site visits and electronic mail. The individual in this position also participates in the creation, editing and distribution of technical documentation and training materials[5].

---

[5] Findings from the 1998 Minnesota Survey of New and Evolving Occupations, Minnesota Department of Economic Security.

The need for specific job-related knowledge or skills is not restricted to just a few occupations or jobs. Employers today look for a broader set of skills – called *employability* skills[6] – in all workers. The Conference Board of Canada developed the employability skills profile of the critical skills required of the Canadian workforce. The profile outlines foundation skills for employability, namely,

- academic: it provides the foundation for good communication skills; a capacity to analyse, evaluate and solve problems; and learn new assignments and new ways of doing the job when technology changes.
- personal management skills: positive attitude; ability to take responsibility and be accountable; ability to deal with changes in the workplace and be innovative; and respect for others.
- teamwork skills: the skills needed to work with others on a job and to achieve the best results.

The importance of these skills is confirmed in recent job advertisements posted by employers in Toronto newspapers[7]. These advertisements also reflect the fact that computer literacy is fast becoming part of "general literacy" requirements.

What are the job trends to 2005?

It is difficult to predict with accuracy which occupations will be in demand in the future and how many jobs will be created in these occupations. Economic conditions, technological developments, demographics and consumer behaviour will continue to influence the labour market, the occupational composition, and the kinds of job opportunities that will be available. Assessing industry trends is the first step in figuring out the potential for growth or decline in occupations or changes in skill requirements.

Projections to the year 2005 indicate that the main source of new job creation will continue to be the service industries. Taken together, the transportation and communications; wholesale and retail trade; finance, insurance and real estate; community, business and personal services and public administration sectors will account for about three-quarters of the projected new jobs in the economy. The manufacturing and construction sectors are projected to contribute 16 and 8 percent respectively to new job creation. Primary resource industries will make a very modest contribution to projected job creation (see Figure 6).

Figure 7 shows the percent contribution of projected new jobs created between 2000 and 2005 by occupation.

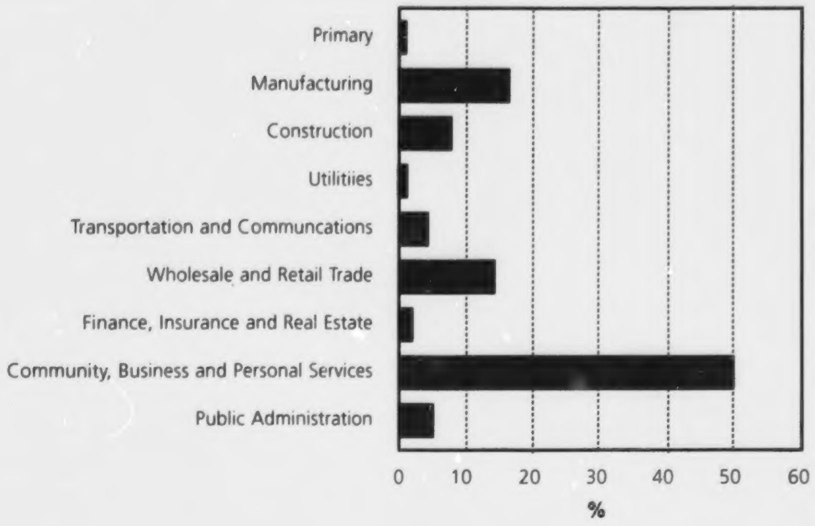
---

[6] For more information on employability skills, visit The Conference Board of Canada's Web site at (www.conferenceboard.ca/nbec/councils.htm).

[7] For more information, visit Workwaves, Toronto's Advertised Job Market, Scadding Court Community Center at (www.workwaves.com).

Figure 6

Projected Job Creation: Percent Share by Industry*
Ontario, 2000 to 2005



---

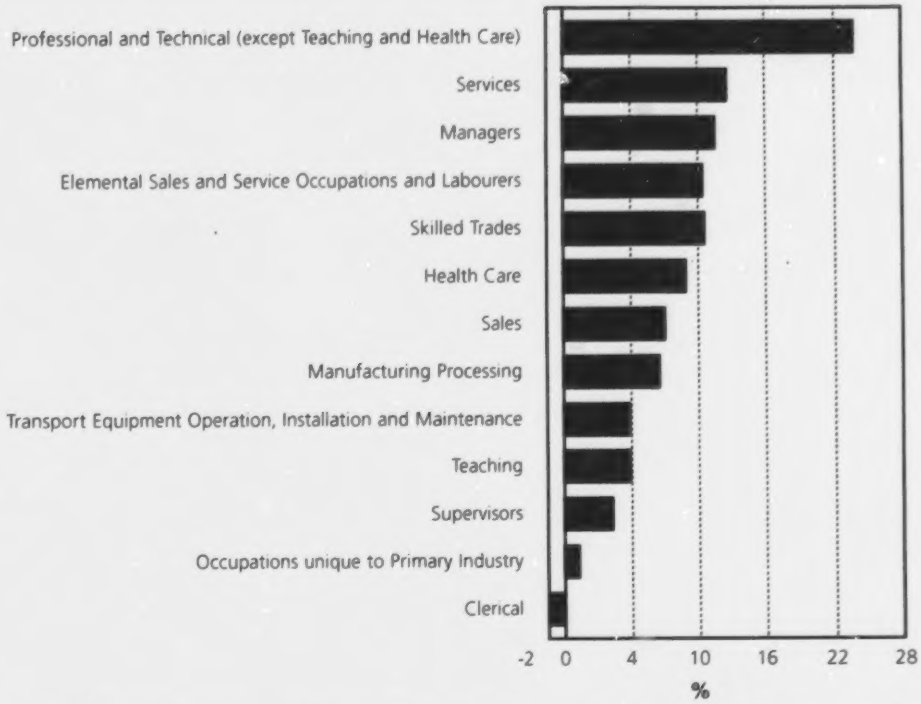
* Statistics Canada, 1980 Standard Industrial Classification.
Source: Forecast using Informetrica's Macroeconomic Models, Canadian Occupational Projection System (COPS), February, 2000.

Among the occupational categories that will contribute 10 percent or more to projected new jobs are the following:

- The *professional and technical* occupational group (excluding teaching ad health care) is expected to account for about 24 percent of new jobs between 2000 and 2005. Most industries employ some professional and technical staff related to the products and services produced. A significant number of workers in these occupations are employed in organizations that provide consulting services to business, such as for management, engineering or information technology. Others, such as lawyers, may be self-employed and provide services directly to people. In general, these jobs require post-secondary (i.e., college diploma or university degree) and even post-graduate education.
- The next largest proportion of new jobs is expected to come from the *general services* category (approximately 13 percent). Many of these occupations, such as hairdressers, cleaners and sports instructors, provide services directly to people. While not all require post-secondary education, many of the jobs in these occupations require good basic skills and knowledge.
- *Managers* are expected to account for over 11 percent of all new jobs. Skills requirements for managers vary, depending on the industry. Senior managers in large corporations and in government often have extensive post-secondary education and training. All managerial positions require a certain number of years of experience.

Figure 7

Projected Job Creation: Percent Share by Occupation*
Ontario, 2000 to 2005



* Grouped according to Statistics Canada, 1991 Standard Occupational Classification.
Source: Labour Market Information and Research, Ministry of Training, Colleges and Universities and Economic Analysis and Information Directorate, Human Resources Development Canada, Ontario Region.

- *Elemental sales and service occupations and labourers* will contribute about 10 percent of new jobs. Many of the occupations are entry-level and may not require a high school diploma for employability. Many of these jobs may also be seasonal or part-time only.
- About 10 percent of new jobs are expected to be created among *skilled trades*. Usually found in construction and manufacturing (such as auto parts or hardware, tool and cutlery industries), skilled trades require a combination of education and on-the-job training and experience. Examples of skilled trades are tool and die makers, crane operators, bricklayers, electricians, terrazzo floor layers, network cable specialists and automotive service mechanics.

As Figure 7 shows, the *clerical* occupational category is expected to decline. Increasingly, clerical functions are performed using more and more sophisticated computer and communications applications.

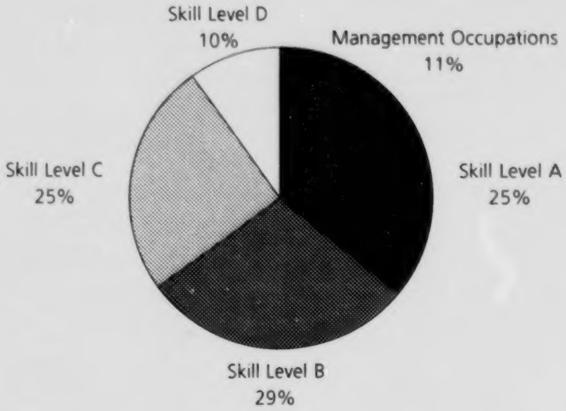
The phenomenon of declining employment, as in the case of the clerical category, does not eliminate all job opportunities. In this category and in many occupations, retiring employees create job vacancies that must be filled. In fact, the retirement of ageing workforces in many sub-sectors of the economy may cause occupational shortages if trained or experienced workers cannot be found to take their place. A significant number of workers in senior management, teaching and some health disciplines, and skilled industrial and construction trades will be retiring.

How do these expectations with respect to industry and occupational employment trends to 2005 translate into educational and training requirements? Figure 8 shows the share of projected new jobs by the level of education and training required.

Clearly, most new job creation will be in occupations requiring considerable education and training. Management skills that are usually acquired through experience following a period of formal education and training will account for about 11 percent of all new jobs. Occupations requiring a university degree will account for 25 percent of projected new jobs and those with extensive post-secondary but less than university degree requirements will account for 29 percent of new jobs. The smallest contribution to new jobs – 10 percent – will come from occupations that require only short on-the-job training without a secondary school diploma.

Figure 8

Contribution by Skill Levels to Projected Employment Growth, Ontario, 2000 to 2005



Note: **Skill Level A** requires university degree (bachelor's, master's or post-graduate).

Skill Level B requires 2 to 3 years of post-secondary education, or 2 to 4 years of apprenticeship training, or 3 to 4 years of secondary school and over 2 years on-the-job training or specific work experience.

Skill Level C requires 1 to 4 years of secondary school, or up to 2 years of on-the-job training or specific work experience.

Skill Level D requires up to 2 years of secondary school and short on-the-job training.

Management occupations are not assigned to a skill level category because factors other than education and training, such as previous experience and investment capital, are often more significant considerations for employment.

Source: Labour Market Information and Research, Ministry of Training, Colleges and Universities; Economic Analysis and Information Directorate, Human Resources Development Canada, Ontario Region.

Occupational Profiles

What Information Is Provided by Each Profile?

This part of *Ontario Job Futures 2000* presents labour market profiles for 157 occupations. Each profile covers the following information: description, main duties, education/training, employment prospects, occupational characteristics, and a selected listing of web sites for more information. Each of these elements is explained in more detail below.

Description

A summary description of the occupation is accompanied by a sampling of job titles that are commonly used for jobs within the occupational group as well as a list of typical employers.

The descriptions are based on the National Occupational Classification system. The unique four-digit number appearing with each profile is the code used for that occupational group in this classification system. This code can be used to cross-reference other sources of information based on the same classification system. (For a more detailed description of the NOC, see Appendix A, How Jobs Get Defined?) Ontario-specific information has been added, as appropriate, to describe the occupation as it exists in Ontario.

Selected Main Duties

The main duties usually carried out by workers in the occupational group highlight the particular skills workers require to work in the occupation.

While the information provided applies to the occupational group as a whole, specific jobs may have distinguishing features in the core duties to be performed. For example, all writers plan, research and write books, reports, scripts, plays, etc. Yet, the particular skills required may vary according to the material to be produced and the audience for whom the material is intended, e.g., novels or plays compared to technical operation and maintenance manuals. As well, some occupational groups include jobs that could be affected differently by new developments. For example, technologists and technicians in the same field could conceivably experience different pressures due to technological change.

Accompanying the main duties is a brief note about the working environment for an occupation. Highly selective, this information has been gleaned from information collected by Human Resource Development Canada, Ontario Region.

Education/Training

Basic information about education and training requirements to enter an occupation is provided. Ontario-specific information, especially for occupations that require a license or other credentials, is noted.

Employment Prospects

The employment prospects section provides information on the expected employment growth for the occupational group to the year 2005 in Ontario. The section starts with a basic assessment of the employment prospects – either strong, good, fair, or limited. This assessment is then explained by some of the key factors that were considered. These factors are:

- Rate of projected employment growth to the year 2005 for the occupation and how it compares to the projected employment growth for all occupations in Ontario;
- Anticipated number of job openings for the occupation through the year 2005 due to replacement needs as older workers retire; and
- Reports by employer on difficulties in finding qualified workers to fill vacant positions and/or employer recruiting activities outside Canada.

Information about significant economic or business trends or technological developments affecting the occupation or the skills needed round out the employment prospects section.

As noted in the Introduction, projections should be interpreted with caution. Shifts in the rate of economic growth, technological developments, business restructuring, or changes in government policies can affect the future growth prospects or skill requirements of the labour market.

Characteristics of Occupation

This component provides information on selected characteristics of each occupation. These characteristics provide insight into the occupation's status within Ontario's labour market.

Estimated employment in 2000: The estimated employment for the year 2000 shows approximately how many people are working in the occupation. Some occupational groups are large – such as secretaries or retail trade managers – each with over 100,000 workers. Other occupations have relatively small workforces; for example, employment of aerospace engineers or forestry technologists and technicians each number around 2,000 or less in Ontario.

Male/Female employment: The proportion of men and women working in an occupation can vary substantially and is continually changing over time. In some occupations, however, men dominate employment; in others – women; and in still others, the workforce is fairly evenly divided between the two sexes.

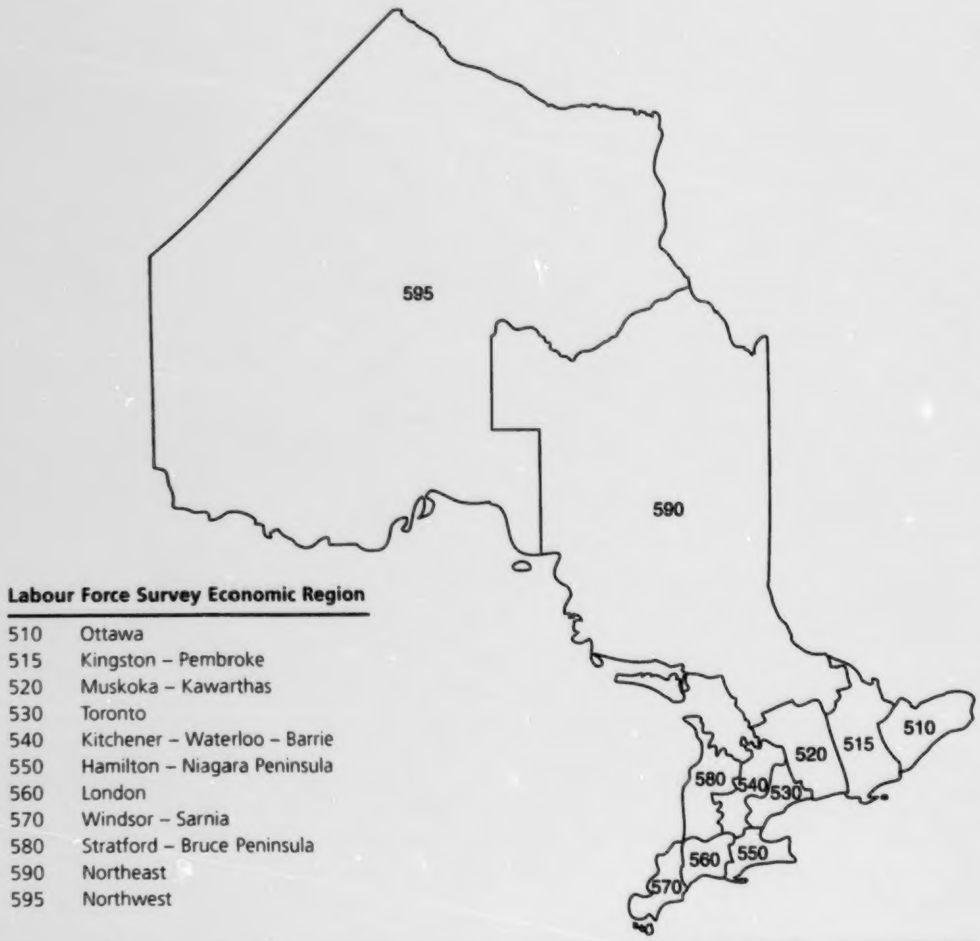
Full-time/part-time employment: In many occupations, such as in management occupations, most of the employment is full-time. However, there is a significant number of occupations where part-time employment is present to varying degrees. For example, many of the jobs for beverage and food servers are part-time. The Labour Force Survey definition of employment used in this analysis counts part-time jobs in the employment totals.

Self-employment: Many workers, especially in occupations associated with manufacturing and production, are employees of organizations. On the other hand, many workers in professional occupations are self-employed. Self-employment has been a growing phenomenon in recent years and is found in varying degrees in a wide range of occupations.

Place of work: In general, most workers are working away from home. However, for many workers in some occupations, such as in construction, there is no fixed workplace address as employees move from job site to job site. For many others, such as bookkeepers, home-based employment may be more common.

Employment by region: The percent distribution of total employment for the occupation and for all occupations is shown for eleven broadly defined regions in Ontario (refer to map). The employment of some occupations is fairly evenly distributed around the province relative to total employment. Examples include secondary school teachers, retail trade managers and secretaries. Employment of other occupations tends to be more concentrated in one or two regions of the province. Examples include forestry technicians and technologists with a greater proportion working in Northeastern Ontario, financial analysts in the Toronto area and motor vehicle assemblers in the Windsor area.

Labour Force Survey
Economic Regions in Ontario



Labour Force Survey Economic Region

510	Ottawa
515	Kingston – Pembroke
520	Muskoka – Kawarthas
530	Toronto
540	Kitchener – Waterloo – Barrie
550	Hamilton – Niagara Peninsula
560	London
570	Windsor – Sarnia
580	Stratford – Bruce Peninsula
590	Northeast
595	Northwest

Main industries of employment: The percent of total employment is shown in the industry sectors that are of greatest importance for the occupation. Some occupations, such as secretaries, are found in many industries while others, such as tool and die makers, are mainly found in one sector, in this case – manufacturing. (For a quick reference, a sampling of typical employers is also provided along with the description of the occupation.)

Average annual employment income: Based on the 1996 census data, the employment income for an occupation is shown and compared with the average employment income for all occupations for 1995. This income estimate is occupation specific, i.e., it is based on information provided for full-time, full-year employment and it illustrates the relative income position for this occupation in comparison to all occupations. It should be noted that in 1995 Ontario had not yet fully recovered from the recession and occupations that are sensitive to economic cycles such as construction trades may have lower incomes than they would have in a fully recovered economy.

Wages: "Starting" and "most frequently paid" wage estimates are based on a province-wide wage survey conducted by Statistics Canada on behalf of the Ontario Network of Employment Skills Training Projects (ONESTEP) in partnership with Human Resources Development Canada, Ontario Region in March 1999. A notation that "estimate is not available" for occupations not covered by the survey is provided.

For more information: For each occupation a sampling of web sites in Ontario and other jurisdictions has been drawn to provide information about education and certification programs; general information about the industry; career features and available jobs; and links to other similar sites. Newspapers, journals, company annual reports and various brochures also provide valuable information. (Also, see Appendix B, Useful Web Sites.)

Many of the web sites are created by or for organizations outside of the provincial/federal governments. These sites might not be available in French. Any specific comments or inquiries regarding these sites should be directed to the individual organization concerned.

Occupational Profiles

0111 Financial Managers

Description

Financial managers plan, organize, direct and control the operation of an accounting, audit or other financial department and develop and implement the financial policies, systems and procedures of an establishment.

Common job titles: Controller; Manager – Internal Audit; Treasurer.

Typical employers: accounting and bookkeeping firms; banks and other financial institutions; federal, provincial and municipal governments; insurance companies.

Selected Main Duties

Financial managers perform some or all of the following duties:

- Prepare or co-ordinate the preparation of financial statements, estimates, summaries and other financial analyses and management reports;
- Evaluate financial reporting systems, accounting procedures and investment activities and make recommendations for changes to procedures, operating systems, budgets and other financial control functions to senior managers and other department or regional managers;
- Recruit staff and oversee training programs.

Working environment: Financial managers work in an office environment. A typical 40-hour workweek is standard, although overtime is often required.

Education/Training

A university degree or college diploma in accounting, business administration, economics, commerce or a related field and completion of company or other management training programs is usually required. For management positions it is also necessary to have several years of experience in accounting, auditing, budgeting, financial planning and analysis or other financial activities. Accounting and audit managers may require a recognized accounting designation.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. The demand for financial managers will increase because of the growing complexity of financial markets and products, and the expansion of international trade. Financial managers now often engage in strategic planning, international finance and planning for overseas acquisitions and trade – thus requiring a broader international perspective. Persons with strong information and technology management skills and familiarity with financial products and services should have the best chance in the job market.

In many firms, job openings are filled through internal promotion. Candidates for executive posts are assigned to progressively more responsible management positions. Some executive search firms do specialize in the financial area. For financial managers with professional designations, professional associations can be a source of information on education and training requirements to enter the profession and on career opportunities.

Characteristics of Occupation

Estimated Employment in 2000: 25,100

	(%)
Male	57
Female	43
Full-time	95
Part-time	5
Self-employed	5
Employees	95
Working away from home	95
Working at home	4
No fixed workplace address	1

Employment by Region

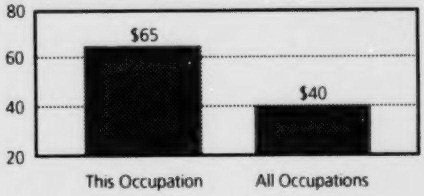
	(%) This Occupation	*(%) All Occupations*
Ottawa	12	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	7	11
Toronto	56	42
London	4	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	1	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

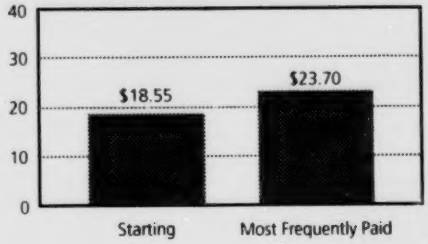
	(%)
Manufacturing	18
Business service	17
Finance and insurance	14
Government service	11
Wholesale trade	10

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Canadian Institute of Management (www.cim.ca)
Society of Management Accountants of Ontario (www.cma-ontario.org)
Certified General Accountants Association of Canada (www.cga-canada.org)

0112 Human Resources Managers

Description

Human resources managers plan, organize, direct and control the operations of human resources and personnel departments. They develop and implement policies, programs and procedures regarding human resource planning, recruitment, collective bargaining, training and development, occupation classification and pay and benefit administration. In large corporations there tend to be two tiers in the human resource management function. At the top, a high-ranking generalist usually supervises various specialists. The second tier of specialist managers supervises recruiters, compensation and benefits specialists and outplacement professionals.

Common job titles: Administrator – Human Resources; Compensation Manager; Director – Labour Relations; Human Resources Manager.

Typical employers: banks and other financial institutions; insurance companies; hospitals; general merchandise stores; computer service firms; federal, provincial and municipal governments.

Selected Main Duties

Human resources managers perform some or all of the following duties:

- Plan human resource requirements in conjunction with other departmental managers;
- Co-ordinate internal and external training and recruitment activities;
- Develop and implement labour relations policies and procedures and negotiate collective agreements;
- Administer employee development, language training and health and safety programs;
- Advise and assist other departmental managers on interpretation and administration of personnel policies and programs;
- Oversee the classification and rating of occupations;
- Organize and conduct employee information meetings on employment policy, benefits and compensation.

Working environment: Human resources managers work in an office environment. A typical 40-hour workweek is standard.

Education/Training

A bachelor's degree in a field related to personnel management, such as business administration, industrial relations, commerce, psychology or liberal arts is usually required. Completion of a professional development program in personnel administration and several years of experience as a personnel officer or human resource specialist may be required as well.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to increase more slowly than the average for all occupations through 2005 with most job openings occurring as older workers retire. Managers in this area will be increasingly involved in implementing and using computerized human resource management systems. Individuals with knowledge of these systems will have better job prospects.

Human resources management remains a relatively difficult field for post-secondary graduates to enter directly, as senior positions tend to be filled through internal promotion. Graduates wishing to enter human resources management must first start out in entry level positions such as payroll benefits administration. Consulting firms are an increasingly important source of employment in these occupations as many companies contract out for some human resource management services.

Characteristics of Occupation

Estimated Employment in 2000: 14,500

	(%)
Male	47
Female	53
Full-time	96
Part-time	4
Self-employed	0
Employees	100
Working away from home	97
Working at home	2
No fixed workplace address	1

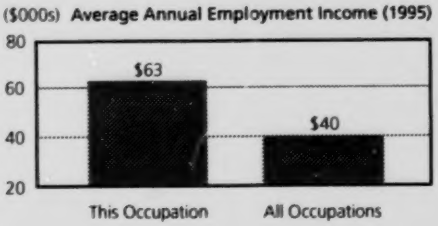
Employment by Region

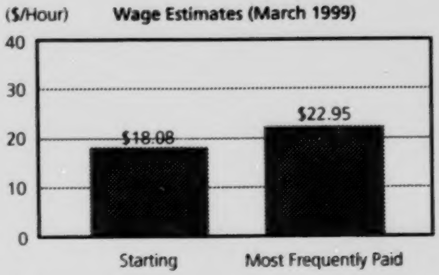
	(%) This Occupation	*(%) All Occupations*
Ottawa	23	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	8	11
Toronto	46	42
London	4	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	1	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

	(%)
Manufacturing	21
Government service	20
Finance and insurance	8
Health and social service	8
Wholesale trade	6

Income and Wages





For more information

Canadian Institute of Management (www.cim.ca)
Human Resources Professionals Association of Ontario (www.hrpao.org)

0113 Purchasing Managers

Description

Purchasing managers plan, organize, direct and control the activities of a purchasing department and develop and implement the purchasing policies of a business or an institution.

Common job titles: Contract Manager; Director – Procurement Operations; Food Purchasing Manager; Materials Manager.

Typical employers: general merchandise stores; hospitals; motor vehicle manufacturers; machinery and equipment manufacturers; electrical and electronic machinery and equipment (wholesale); motor vehicle parts manufacturers; federal and provincial governments.

Selected Main Duties

Purchasing managers perform some or all of the following duties:

- Develop purchasing policies and procedures and control purchasing department budget;
- Identify vendors of materials, equipment or supplies;
- Evaluate cost and quality of goods or services;
- Negotiate or oversee the negotiation of purchase contracts;
- Participate in the development of specifications for equipment, products or substitute materials;
- Review and process claims against suppliers;
- Interview, hire and oversee training of staff.

Working environment: Purchasing managers work in an office environment. The typical 35 to 40-hour workweek is standard, although overtime is often required. Some managers spend part of their time travelling to suppliers, seminars or trade shows.

Education/Training

A bachelor's degree or college diploma in business administration, commerce or economics is usually required. Purchasing managers responsible for purchasing specialized materials or business services may require a related university degree or diploma. For example, a bachelor's degree or college diploma in engineering may be required for purchasing industrial products. Several years of experience as a purchasing agent or officer are required. Certification from the Professional Purchasing Association of Canada or the National Institute of Government Purchasing may be advantageous.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Growth in manufacturing activities and wholesale and retail trade should result in more demand for purchasing managers.

The increasing use of computers and business-to-business e-commerce will reduce much of the paper work involved in ordering and procuring supplies. The purchasing managers' skills will shift to negotiating and monitoring of a supplier's relationship with the buyer. Assurance of quality standards for purchased parts and supplies is becoming increasingly important, so that purchasing managers will likely need to be more familiar with Total Quality Management and the International Standards Organization's quality standards (ISO9000 series).

Characteristics of Occupation

Estimated Employment in 2000: 3,600

	(%)
Male	73
Female	27
Full-time	98
Part-time	2
Self-employed	0
Employees	100
Working away from home	98
Working at home	2
No fixed workplace address	0

Employment by Region

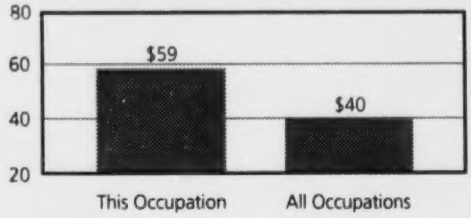
	(%) This Occupation	*(%) All Occupations*
Ottawa	14	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	11	9
Hamilton-Niagara Peninsula	12	11
Toronto	46	42
London	3	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	1	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

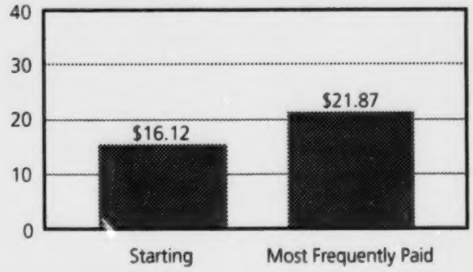
	(%)
Manufacturing	38
Wholesale trade	20
Retail trade	13
Government service	8

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Purchasing Management Association of Canada (www.pmac.ca)
National Institute of Government Purchasing (www.nigp.org)

0121 Insurance, Real Estate and Financial Brokerage Managers

Description

Insurance, real estate and financial brokerage managers plan, organize, direct and control the activities of departments or establishments that provide insurance, mortgage, real estate and investment services.

Common job titles: Bond Manager; Commodities Trading Manager; Investment Manager; Securities Sales Director.

Typical employers: insurance companies; insurance and real estate agencies; investment firms; banks and other financial institutions; operators of buildings and dwellings.

Selected Main Duties

The main duties associated with planning, organizing, directing and controlling are determined by the nature of the business establishment:

- *Insurance managers* are found in establishments or departments that provide automobile, fire, life, property or other types of insurance services.
- *Real estate managers* are found in establishments or departments that buy, sell and lease residential and commercial property for clients.
- *Mortgage broker managers* are found in establishments or departments that find lenders or lending institutions on behalf of clients seeking a mortgage.
- *Securities managers* are found in establishments or departments that buy and sell stocks, bonds and other forms of investments on behalf of individual or institutional clients.

Working environment: Managers work in an office environment. Real estate managers often conduct property visits.

Education/Training

A university degree or college diploma in business administration, economics or other related field is usually required. For management positions, several years of experience within the appropriate industry are usually required. For insurance, real estate and financial brokerage managers, specific brokerage licenses are generally a prerequisite for management positions. As well, professional designations acquired during a financial services career, such as the Chartered Financial Analyst (CFA), Fellow Real Estate Institute (FRI) are advantageous depending upon the industry sector. In addition, many financial institutions encourage their staff to upgrade their management skills through in house courses or through industry sponsored training provided by groups such as the Institute of Canadian Bankers or the Trust Companies Institute.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is projected to increase more slowly than the average for all occupations through 2005. In addition to job growth, many job openings will be created each year from the need to replace workers who retire.

Technological change is raising the skill requirements for these managers. Computerized financial systems, automatic teller machines and real estate listing services are widespread in the finance, insurance and real estate industry.

Characteristics of Occupation

Estimated Employment in 2000: 8,300

	(%)
Male	64
Female	36
Full-time	93
Part-time	7
Self-employed	7
Employees	93
Working away from home	90
Working at home	9
No fixed workplace address	1

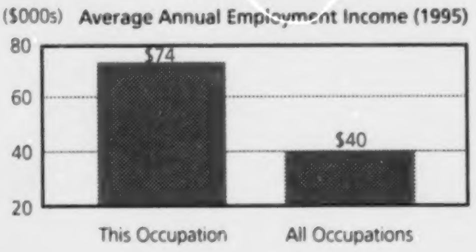
Employment by Region

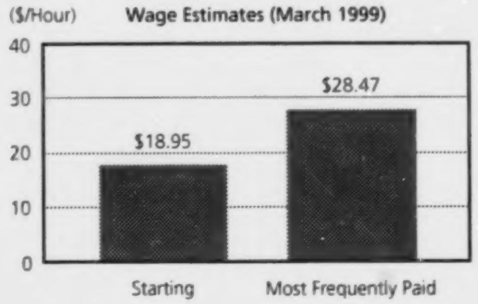
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	9	11
Toronto	58	42
London	4	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	1	3
Northeast	2	5
Northwest	1	2

Main Industries of Employment

	(%)
Insurance and real estate agents	39
Insurance companies	34

Income and Wages





For more information

Institute of Canadian Bankers (www.icb.org)
Real Estate Institute of Canada (www.reic.ca)
Insurance Institute of Canada (www.iic-iac.org)

0122 Banking, Credit and Other Investment Managers

Description

Banking, credit and other investment managers plan, organize, direct and control the activities of financial establishments or operational departments within such establishments, or credit departments in industrial and commercial establishments.

Common job titles: Commercial Banking Manager; Credit and Accounts Manager; Mortgage and Consumer Credit Manager; Trust Company Manager.

Typical employers: banks; trust companies; credit unions; department stores; insurance companies; consumer loan companies; mortgage investment companies.

Selected Main Duties

Banking managers perform some or all of the following duties:

- Ensure the institution's policies and procedures are followed according to established guidelines and make recommendations for improvement;
- Promote the sale of loan, investment and other banking services to attract corporate and individual customers;
- Interview corporate and individual customers and respond to customer enquiries;
- Analyse, review and approve or reject loan and credit applications;
- Monitor processing of loan applications and credit investigations;
- Oversee preparation of monthly financial and branch progress reports;
- Recruit personnel and oversee their training.

Credit managers perform some or all of the following duties:

- Administer corporate, commercial and personal loan accounts;
- Evaluate and review loan and credit applications;
- Approve or reject credit applications, establish credit limits and determine repayment plans or schedules;
- Ensure collection of overdue or delinquent accounts;
- Ensure credit policies and procedures are followed according to established guidelines;
- Prepare credit and loan reports;
- Recruit credit personnel and oversee their training.

Working environment: Managers work in an office environment. In the rapidly changing world of finance, managers must be prepared to act quickly often under pressure. Extended workweeks exceeding 40 hours a week are quite common. Some major banks offer separate investment services staffed by commission-only or salary-plus-commission representatives who sell in-house mutual funds and other investment products.

Education/Training

A university degree or college diploma in business administration, commerce, economics or a related field is usually required. Completion of company or other management training programs is usually required. Several years of experience within the industry, including supervisory experience, are required. In addition, many financial institutions encourage their staff to upgrade their management skills through in-house courses or through industry sponsored training provided by organizations such as the Institute of Canadian Bankers.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Demand for banking services tends to grow as the economy grows. The increasing complexity of financial markets and products should further increase the demand for financial managers – especially those with higher technical and analytical skills.

In major financial institutions, many managerial job openings are filled from within. Candidates for executive posts are assigned to progressively more challenging management positions. Some executive search firms do specialize in the financial industry. For financial managers with professional designations such as Chartered Accountant and Chartered Financial Analyst, professional associations can be a source of information for professional requirements and career planning.

Characteristics of Occupation

Estimated Employment in 2000: 31,500

	(%)
Male	49
Female	51
Full-time	97
Part-time	3
Self-employed	1
Employees	99
Working away from home	98
Working at home	2
No fixed workplace address	0

Employment by Region

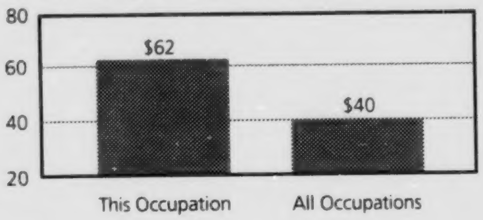
	(%) This Occupation	*(%) All Occupations*
Ottawa	7	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	9	11
Toronto	60	42
London	4	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	2	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

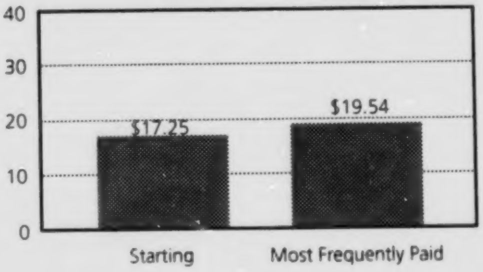
	(%)
Banks, trust and mortgage companies, credit unions	83

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Credit Institute of Canada (www.creditedu.org)
Institute of Canadian Bankers (www.icb.org)
The Investment Funds Institute of Canada (www.ific.ca)

0213 Information Systems and Data Processing Managers

Description

Information systems and data processing managers plan, organize, direct and control the activities of computerized information systems and electronic data processing departments and companies.

Common job titles: Computer Systems Manager; Data Centre Manager; Systems Development Manager.

Typical employers: computer service firms; federal and provincial governments; banks and other financial institutions; telecommunication companies; insurance companies; business machine manufacturers; electrical and electronic machinery and equipment wholesalers; architectural, engineering, and other scientific companies.

Selected Main Duties

Information systems and data processing managers perform some or all of the following duties:

- Develop and implement policies and procedures for electronic data processing and computer systems operations and development;
- Meet with clients to discuss data processing or system requirements and specifications;
- Analyse information system requirements and performance, and develop and implement new and modified systems;
- Control the budget and expenditures of the department or company;
- Recruit and supervise computer analysts, programmers and other personnel and oversee their professional development and training.

Working environment: Data processing and information systems managers spend much of their time in an office. Most work 40 hours a week with occasional overtime. Project deadlines and unexpected system downtime can result in high stress levels. Some travel may be necessary.

Education/Training

A bachelor's or master's degree in computer science, business administration, commerce or engineering is usually required. For management positions, several years of experience in computer programming and systems analysis or in a computer application area, including supervisory experience, are required.

Employment Prospects

Over the next five years: Strong

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. The expertise needed to design, deploy, integrate and manage computer information technology will continue to be in high demand over the next several years. Due to the rapid pace of technological change in this area, managers will be expected to continuously upgrade their knowledge and skills, either through professional development programs or additional formal post-secondary education, to keep abreast of emerging technologies.

Most advertised job positions currently stress the need for skills in e-commerce, network administration, programming languages and database software. In addition, many of these advertisements stress the need for communication and teamwork skills. There are a large number of employment agencies and executive search firms active in this sector.

Characteristics of Occupation

Estimated Employment in 2000: 17,000

	(%)
Male	75
Female	25
Full-time	97
Part-time	3
Self-employed	5
Employees	95
Working away from home	93
Working at home	5
No fixed workplace address	2

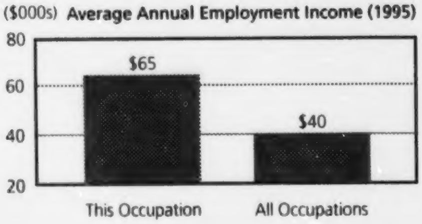
Employment by Region

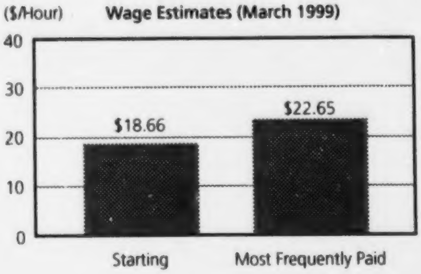
	(%) This Occupation	*(%) All Occupations*
Ottawa	31	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	5	9
Hamilton-Niagara Peninsula	6	11
Toronto	50	42
London	2	5
Windsor-Sarnia	1	5
Stratford-Bruce Peninsula	0	3
Northeast	1	5
Northwest	0	2

Main Industries of Employment

	(%)
Business service	42
Manufacturing	13
Government service	13
Finance and insurance	9
Wholesale trade	7

Income and Wages





For more information

Institute for Certification of Computer Professionals (www.iccp.org)
Canadian Information Processing Society (www.cips.ca)

0311 Managers in Health Care

Description

Managers in health care plan, organize, direct and control the delivery of health care services, such as diagnosis and treatment, nursing and therapy, within institutions that provide health care services.

Common job titles: Chief of Anaesthesia; Director of Clinical Medicine; Director of Nursing; Residential Program Manager – Mental Health Centre.

Typical employers: hospitals; institutional health and social services firms; non-institutional health services; non-institutional social services; health and social service associations and agencies; medical laboratories; offices of physicians, surgeons and dentists.

Selected Main Duties

Managers in health care perform some or all of the following duties:

- Consult with boards of directors and senior managers to maintain and establish standards for the provision of health care services;
- Develop evaluation systems to monitor the quality of health care given to patients;
- Monitor the use of diagnostic services, in-patient beds and facilities to ensure effective use of resources;
- Develop and implement plans for new programs, special projects, new material and equipment acquisitions and future staffing levels in their department or establishment;
- Plan and control departmental or establishment budget;
- Represent the department or establishment at meetings with government officials, the public, the media and other organizations;
- Supervise health care supervisors and professionals;
- Recruit health care staff of the department or establishment.

Working environment: Long hours are the norm for health care managers. Around-the-clock facilities mean that an emergency could bring the manager in at any time of the day.

Education/Training

Although in recent years hospital administration is emerging as a professional specialty, administrators of departments such as surgery, clinical medicine or laboratory medicine are usually required to have the education and training of a specialist physician. Administrators of other departments, such as nursing, dietetics or physiotherapy, are also usually required to have the education and training of the medical professionals in that department. Several years of experience in the relevant profession, including supervisory experience, are usually required. There is limited mobility between departments in different medical specializations. Progression to senior management positions in health care services is possible with experience.

Employment Prospects

Over the next five years: Good

Openings resulting from job growth and the need to replace workers who retire should create good employment opportunities through 2005. The on-going restructuring of health and medical services towards more non-hospital care is affecting the nature of employment opportunities for these occupations. Opportunities for health service managers will likely arise due to the varied needs of the aging population – for example, managing nursing homes.

In addition to the rationalization of institutions, computerized management information and communications systems play an increasing role in the delivery of health care services. Skills in business, financial and general management will become more important for health care managers.

Characteristics of Occupation

Estimated Employment in 2000: 9,500

	(%)
Male	26
Female	74
Full-time	91
Part-time	9
Self-employed	4
Employees	96
Working away from home	96
Working at home	3
No fixed workplace address	1

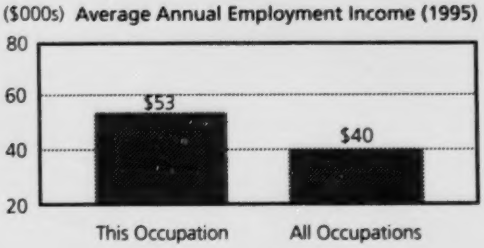
Employment by Region

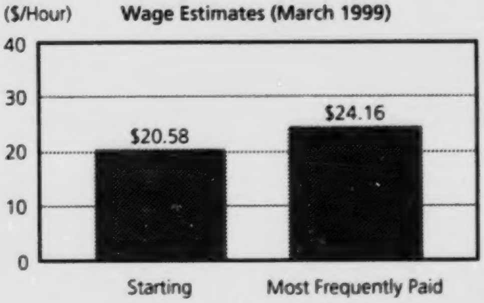
	(%) This Occupation	*(%) All Occupations*
Ottawa	15	10
Kingston-Pembroke	6	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	11	11
Toronto	34	42
London	7	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	3	3
Northeast	6	5
Northwest	3	2

Main Industries of Employment

	(%)
Health and social services	91

Income and Wages





For more information

Ontario Hospital Association (www.oha.com)

Canadian College of Health Service Executives (www.cchse.org)

0611 Sales, Marketing and Advertising Managers

Description

Sales, marketing and advertising managers plan, organize, direct and control the activities of establishments and departments involved in commercial, industrial and wholesale sales, marketing, advertising and public relations.

Common job titles: Advertising Director; Director – Communications; Manager – Media Relations; Sales Director.

Typical employers: advertising firms; business services firms; electrical and electronic machinery and equipment wholesalers; computer service firms; food wholesalers; telecommunication companies; machinery and equipment wholesalers.

Selected Main Duties

The following is a summary of the main duties for occupations in this group:

- *Sales managers* are engaged in the activities of sales departments in commercial, industrial, wholesale and other non-retail establishments;
- *Marketing managers* establish distribution networks for products and services, initiate market research studies and analyse their findings, assist in product development, and direct the marketing strategies of establishments;
- *Advertising managers* are engaged in activities of firms and departments that develop and implement advertising campaigns to promote the sales of products and services;
- *Public relations managers* direct establishments and departments that develop and implement communication strategies and information programs, publicize activities and events, and maintain media relations on behalf of businesses, governments and other organizations.

Working environment: Sales, marketing and advertising managers work in an office environment. They often meet with other managers within and between departments. Project deadlines often require long hours and weekend work.

Education/Training

Sales and marketing managers usually require a university degree or college diploma in business administration or in a related field, with a specialization in sales or marketing and several years of experience as a sales or marketing representative or related occupation. Marketing managers should be creative and analytical, familiar with research techniques as well as emerging market trends. Entry into sales, marketing and retailing management positions usually entails starting at the entry-level positions of the organization such as selling in the field in order to gain knowledge of the product and the clientele. Some companies such as pharmaceutical and high tech firms may require a technical or scientific background. Others like office suppliers and retailers often provide training.

Advertising and public relations managers require a university degree or college diploma in public relations, communications, marketing, journalism or in a related field and several years of experience as an advertising officer, public relations officer, communications officer or related occupation.

Employment Prospects

Over the next five years: Good

Demand for qualified workers is expected to continue to be strong. Development of electronic methods for sales and marketing functions, such as e-commerce, means that these managers will need to develop expertise in this area. Familiarity with desktop publishing and with external database technologies may also be important for these managers.

Increasing operations in foreign market, as well as foreign competition, will require increased knowledge and experience in international marketing and advertising.

Characteristics of Occupation

Estimated Employment in 2000: 55,900

	(%)
Male	72
Female	28
Full-time	95
Part-time	5
Self-employed	9
Employees	91
Working away from home	85
Working at home	11
No fixed workplace address	4

Employment by Region

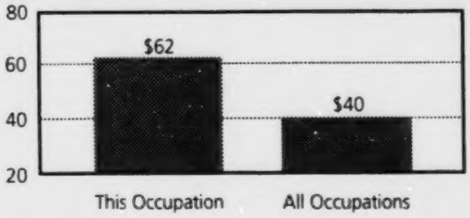
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	9	11
Toronto	59	42
London	4	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	1	3
Northeast	2	5
Northwest	1	2

Main Industries of Employment

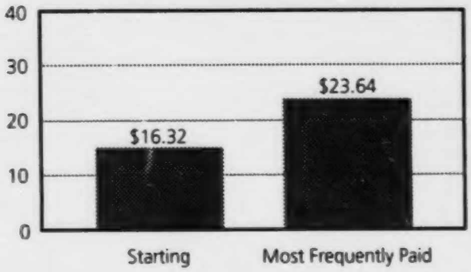
	(%)
Wholesale trade	38
Manufacturing	24
Business service	16

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Canadian Institute of Marketing (www.cinstmarketing.ca)
Chartered Institute of Marketing Management of Ontario (home.inforamp.net/~lvp/CIMMO/cimmap.htm)
Institute of Canadian Advertising (www.ica-ad.com)

0621 Retail Trade Managers

Description

Retail trade managers plan, organize, direct and control the operations of establishments that sell merchandise or services on a retail basis. Retail trade managers are employed by retail sales establishments or they may own and operate their own store.

Common job titles: Antique Dealer; Bookstore Manager; Service Station Manager; Supermarket Manager.

Typical employers: food stores; general merchandise stores; automobile dealers; retail stores; women's, men's and children's clothing stores; gasoline service stations; motor vehicle repair shops; hobby and novelty stores.

Selected Main Duties

Retail trade managers perform some or all of the following duties:

- Manage staff and assign duties;
- Study market research and trends to determine consumer demand, potential sales volumes and effect of competitors' operations on sales;
- Determine merchandise and services to be sold, and implement price and credit policies;
- Locate, select and procure merchandise for resale;
- Develop and implement marketing strategies;
- Plan budgets and authorize expenditures;
- Determine staffing requirements and hire or oversee hiring of staff.

Working environment: Retail trade managers must interact on a continuous basis with employees. Office work often involves extensive paperwork and planning. Irregular working hours are common.

Education/Training

A university degree or college diploma in business administration or other field related to the product or service being sold may be required. Several years of related retail sales experience at increasing levels of responsibility is usually required. Entry into sales marketing and retailing management positions usually entails starting in entry-level positions of the organization, selling in the field in order to know the product and the clientele. Some large retailers provide management training, either internally or jointly with post-secondary institutions such as Ryerson Polytechnical University.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Projected employment growth of retail managers reflects largely the patterns of employment growth in the retail trade industry in which they are concentrated. In addition, because of the large size of this occupational group, many job openings will be created each year from the need to replace workers who retire.

Retailing firms will continue to improve their operations using point-of-sale data entry, computerized inventory control, computerized order entry, electronic scanning and telecommunications technologies. E-commerce will become an increasingly important factor. Managers will need to be familiar with these systems.

Characteristics of Occupation

Estimated Employment in 2000: 135,000

	(%)
Male	60
Female	40
Full-time	92
Part-time	8
Self-employed	19
Employees	81
Working away from home	91
Working at home	7
No fixed workplace address	2

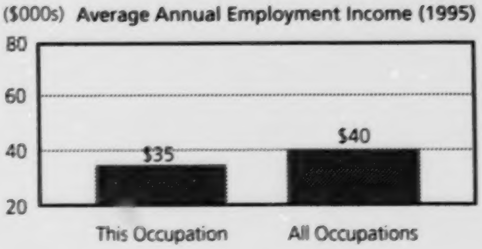
Employment by Region

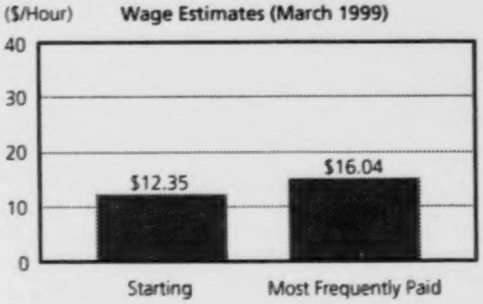
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	12	11
Toronto	41	42
London	6	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	3	3
Northeast	6	5
Northwest	2	2

Main Industries of Employment

	(%)
Retail food	18
Retail automotive vehicles	14
Retail shoe	10
General retail merchandise	7
Retail household furniture	5

Income and Wages





For more information

Canadian Institute of Management (www.cim.ca)
Retail Council of Canada (www.retailcouncil.org)

0631 Restaurant and Food Service Managers

Description

Restaurant and food service managers plan, organize, direct and control the operations of restaurants, bars, cafeterias and other food and beverage services.

Common job titles: Banquet Manager; Cafeteria Manager; Dining Room Manager; Restaurateur.

Typical employers: food services; taverns, bars and night clubs; hotels, motels and tourist courts; food stores.

Selected Main Duties

Restaurant and food service managers perform some or all of the following duties:

- Determine type of services to be offered and implement operational procedures;
- Recruit staff and oversee staff training;
- Set staff work schedules and monitor staff performance;
- Control inventory, monitor revenues and modify procedures and prices;
- Resolve customer complaints and ensure health and safety regulations are followed;
- Negotiate arrangements with suppliers for food and other supplies;
- Negotiate arrangements with clients for catering or use of facilities for banquets or receptions.

Working environment: Working hours for restaurant managers tend to be during the evenings and weekends. Many food service managers work more conventional hours, as cafeteria and other related facilities are often open weekdays for breakfast and lunch. Workweeks of over 50 hours are not uncommon. The job is particularly hectic during the busiest dining hours. There may be more than one work shift and more than one manager in charge per day due to the long opening hours in many establishments.

Education/Training

Completion of a college or other programs related to hospitality or food and beverage management is usually required. Several years of experience in the food service sector, including supervisory experience, are required. Most restaurant and food service managers are promoted up through the ranks. Most begin in front-line operational jobs in the industry and progress through supervisory positions, such as food and beverage service supervisor or maitre d'hôtel, into management positions. It takes both time and proven credentials to become a manager. There are an increasing number of diploma and management programs in hospitality and tourism management that assist in the development of management skills for this sector.

Employment Prospects

Over the next five years: Good

Job seekers with the appropriate skills and qualifications should have good job opportunities, as employers across Ontario report difficulties in finding qualified workers to fill vacant positions. Demand for these managers is largely dependent on consumer spending, which is expected to remain strong. In addition, growth in the population of elderly people will result in a growing demand for food service manager jobs in residential care facilities and supportive care services.

Use of computerized ordering systems and inventory control systems will continue to increase. Managers will need to be familiar with these systems. Also, employers are stressing the need for teamwork, communication, planning and organizing skills.

Characteristics of Occupation

Estimated Employment in 2000: 57,200

	(%)
Male	57
Female	43
Full-time	89
Part-time	11
Self-employed	17
Employees	83
Working away from home	95
Working at home	3
No fixed workplace address	2

Employment by Region

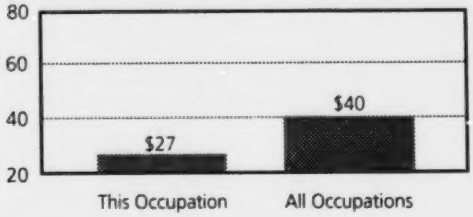
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	12	11
Toronto	44	42
London	6	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	2	3
Northeast	5	5
Northwest	2	2

Main Industries of Employment

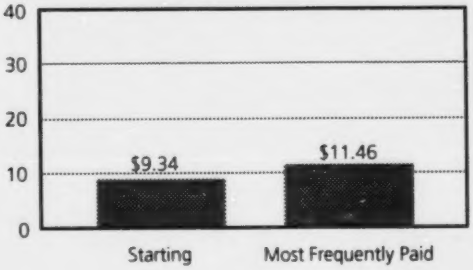
	(%)
Food and beverage service	88

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Canadian Restaurant and Foodservices Association (www.crfa.ca)
Canadian Institute of Management (www.cim.ca)

0711 Construction Managers

Description

Construction managers plan, organize, direct and control the activities of a construction company or a construction department within a company, under the direction of a general manager or other senior managers.

Common job titles: Construction Superintendent; General Contractor; Pipeline Construction Manager; Residential Construction Manager.

Typical employers: residential building developers; non-residential building developers; construction companies; building construction firms; construction site maintenance firms; highway and heavy construction firms; architectural, engineering and other scientific companies; interior and finishing construction firms; exterior construction firms.

Selected Main Duties

Construction managers perform some or all of the following duties:

- Manage construction projects from start to finish according to schedule, specifications and budgets;
- Prepare and submit construction project budget estimates;
- Plan and prepare construction schedules and milestones and monitor progress against established schedules;
- Prepare contracts and negotiate revisions, changes and additions to contractual agreements with architects, consultants, clients, suppliers and subcontractors;
- Develop and implement quality control programs;
- Represent company on matters such as business services and union contracts negotiation;
- Prepare progress reports and issue progress schedules to clients;
- Direct the purchase of building materials and land acquisitions;
- Hire and supervise the activities of subcontractors and subordinate staff.

Working environment: Construction managers generally work out of an office environment or at a field office at the construction site. Standard hours are rare. Individual deadlines and projects often determine the hours required of the manager.

Education/Training

Construction managers must have a good technical knowledge of the processes used in the sector and usually have a number of years of experience in the industry, as well as a degree in engineering or architecture or a diploma in construction technology. Many construction managers begin their management career as project co-ordinators responsible for the administration of subcontracts and contract changes, and then progress to overall management and administrative responsibility for entire projects. Construction managers may come from the ranks of tradespeople, field engineers or estimators.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through 2005. Persons with a strong background in building technology with proven managerial skills should have the best opportunities. In addition, many job openings will be created each year from the need to replace workers who retire.

Activity in the construction sector tends to move up and down as a reflection of growth and recession in the economy. However, many of the construction managers remain employed even in a down cycle to plan schedules or estimate costs of future construction projects. Advances in building materials, the development of "smart buildings" and the proliferation of new building standards will make work of construction managers more complex.

Characteristics of Occupation

Estimated Employment in 2000: 12,100

	(%)
Male	95
Female	5
Full-time	92
Part-time	8
Self-employed	25
Employees	75
Working away from home	55
Working at home	13
No fixed workplace address	32

Employment by Region

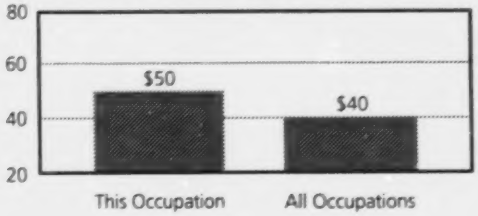
	(%) This Occupation	*(%) All Occupations*
Ottawa	8	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	4	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	11	11
Toronto	42	42
London	5	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	3	3
Northeast	6	5
Northwest	2	2

Main Industries of Employment

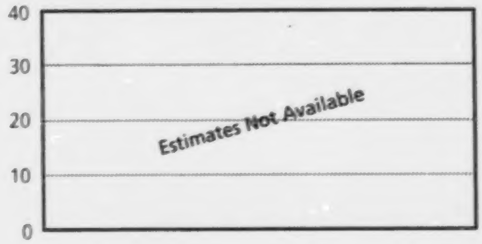
	(%)
Building construction	47
Trade contracting	27
Industrial and heavy (engineering) construction	7

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Ontario Construction Secretariat (www.iciconstruction.com)
Canadian Institute of Management (www.cim.ca)

0712 Residential Home Builders and Renovators

Description

Residential home builders own, operate and manage companies engaged in the construction of new residential homes. Residential home renovators own, operate and manage companies engaged in the renovation of existing residential homes. They usually act as general contractors for clients wishing to substantially upgrade or remodel their buildings.

Common job titles: Contractor – Residential Homes; Renovation Contractor; Home Renovation Contractor.

Typical employers: residential building developers; interior and finishing construction firms; building construction firms; exterior construction firms; construction companies.

Selected Main Duties

Residential home builders and renovators perform some or all of the following duties:

- Plan, organize, direct and control activities of a residential home building or renovating company;
- Prepare bids for home construction or renovation projects,
- Consult with customers, architects and engineers regarding plans and specifications;
- Select and employ trade subcontractors to do specialized work, such as plumbing, heating and electrical work;
- Plan and prepare work schedules and co-ordinate the activities of subcontractors;
- Inspect work performed by subcontractors to ensure quality and conformity with plans and specifications;
- Prepare and maintain a directory of suppliers and trade subcontractors;
- Develop and implement marketing and advertising strategies to promote company's products and services;
- Perform carpentry or other trade work during home construction or renovation activities.

Working environment: Residential home builders and renovators divide their time between on-site and an office environment, organizing the contracts and work required for successful completion of a project. Communication and co-ordination of the various aspects of the project may occupy much of the builder's time.

Education/Training

Extensive experience in the home construction industry, including experience as a general supervisor, is usually required for self-employed home builders or home renovators. No formal education degrees or license are required. However, professional home builders and renovators must be skilled in project management, building science, design, business management, sales and marketing. The Ontario Home Builders' Association offers a Renovation Business Training Program for persons planning to become general contractors.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Job opportunities for residential home builders and renovators depend on the volume of house construction and renovation which, in turn, is largely dependent on the state of the economy. The renovation sector benefits from an ageing stock of housing and trends towards home improvement.

Advances in building materials, the development of "smart buildings" and the proliferation of new building standards will make the work of residential home builders and renovators more complex.

Characteristics of Occupation

Estimated Employment in 2000: 21,200

	(%)
Male	96
Female	4
Full-time	83
Part-time	17
Self-employed	52
Employees	48
Working away from home	27
Working at home	16
No fixed workplace address	57

Employment by Region

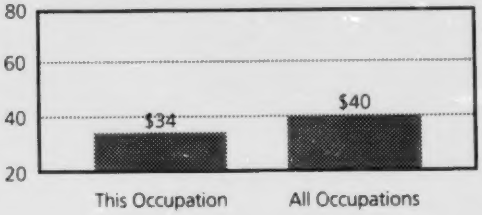
	(%) This Occupation	*(%) All Occupations*
Ottawa	12	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	5	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	11	11
Toronto	39	42
London	6	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	3	3
Northeast	4	5
Northwest	2	2

Main Industries of Employment

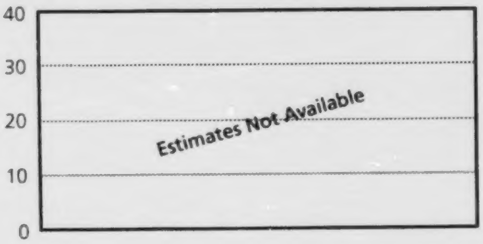
	(%)
Building construction	75
Trade contracting	21

Income and Wages

($000s) Average Annual Employment Income (1995)



($/Hour) Wage Estimates (March 1999)



For more information

Ontario Home Builders' Association (www.homesontario.com)
Canadian Home Builders' Association (www.chba.ca)

0911 Manufacturing Managers

Description

Manufacturing managers plan, organize, direct and control the operations of a manufacturing establishment or of a production department within a manufacturing establishment, under the direction of a general manager or other senior manager.

Common job titles: Automobile Production Manager; Factory Superintendent; Paper Mill Manager; Tire Plant Manager.

Typical employers: motor vehicle parts manufacturers; machinery and equipment manufacturers; primary steel producers; motor vehicle manufacturers; plastic products companies; electronic equipment manufacturers; food product companies.

Selected Main Duties

Manufacturing managers perform some or all of the following duties:

- Develop and implement plans to efficiently use materials, labour and equipment to meet production targets;
- Plan and manage the establishment or departmental budget;
- Develop production schedules and maintain an inventory of raw materials and finished products;
- Plan and implement changes to machinery and equipment, production systems and methods of work;
- Direct quality control inspection system and develop production reporting procedures;
- Develop equipment maintenance schedules and recommend the replacement of machines;
- Train or oversee training of employees in the use of new equipment or production techniques.

Working environment: Most manufacturing managers divide their time between office work and the plant floor. Established health and safety practices must be followed when on the floor to ensure safety. Meeting with subordinates and co-workers dominates office time. More than a 40-hour workweek is the norm. Emergencies may require managers to be on site at any time.

Education/Training

Completion of a college or university program in engineering or business administration is usually required. Five to ten years of supervisory experience in manufacturing is required, preferably in the specific industry of interest.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. The demands on manufacturing managers and primary production managers become more critical due to the continuous need to adjust production processes through effective planning. At the same time, growing productivity among manufacturing managers and organizational restructuring will limit the demand for these workers.

Many employers report difficulties in finding qualified workers to fill vacant positions. Employers look for managers with excellent communication, planning and organizing, and teamwork skills. Persons with spreadsheet, word-processing and database software experience would have an advantage in the job market.

Characteristics of Occupation

Estimated Employment in 2000: 35,900

	(%)
Male	86
Female	14
Full-time	97
Part-time	3
Self-employed	5
Employees	95
Working away from home	95
Working at home	4
No fixed workplace address	1

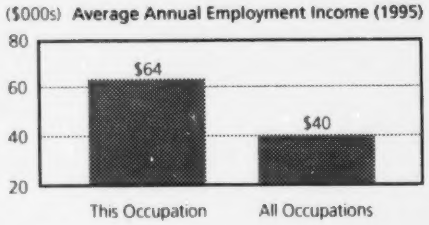
Employment by Region

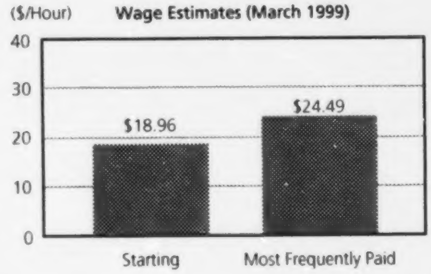
	(%) This Occupation	*(%) All Occupations*
Ottawa	6	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	13	9
Hamilton-Niagara Peninsula	12	11
Toronto	49	42
London	5	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	2	3
Northeast	2	5
Northwest	1	2

Main Industries of Employment

	(%)
Fabricated metal products	11
Transportation equipment	10
Electrical and electronic products	8
Chemical and chemical products	7
Food processing	7

Income and Wages





For more information

Canadian Institute of Management (www.cim.ca)
Alliance of Manufacturers and Exporters of Canada (www.the-alliance.com)
APICS VIII, The Educational Society for Resource Management (www.apics8.org)

1111 Financial Auditors and Accountants

Description

Financial auditors examine and analyse the accounting and financial records of individuals or establishments to ensure accuracy and compliance with accounting procedures.

Common job titles: Accountant; Chartered Accountant (CA); Certified General Accountant (CGA); Certified Management Accountant (CMA); Financial Auditor; Internal Auditor.

Typical employers: accounting and bookkeeping firms; banks and other financial institutions; insurance companies; federal, provincial and municipal governments.

Selected Main Duties

Financial auditors and accountants perform some or all of the following duties:

- Examine and analyse journal and ledger entries, bank statements, inventories, expenditures, tax returns and other accounting and financial records, documents and systems of an individual, department, company or other establishment to ensure financial recording accuracy and compliance with established accounting standards, procedures and internal controls;
- Prepare detailed reports on audit findings and make recommendations to improve an individual's or establishment's accounting and management practices; financial statements; income tax returns; reports;
- Conduct field audits of business to ensure compliance with provisions of the Income Tax Act, Canadian Business Corporations Act or other statutory requirements;
- May supervise other auditors, other accountants and articling students;
- Plan, set up and administer accounting systems and prepare financial information for an individual, department, company or other establishment;
- Act as a trustee in bankruptcy proceedings.

Working environment: Accountants and auditors work in an office environment. Public accountants often visit the offices of clients while conducting audits. Those accountants who operate on behalf of a large firm may be required to travel frequently. Depending on the specialty and type of job, accountants may work long hours, especially during the tax season.

Education/Training

Chartered accountants require a university degree and completion of a training program approved by the Institute of Chartered Accountants. Certified general accountants and certified management accountants usually require some post-secondary education related to accounting and completion of a training program approved by the Certified General Accountants or the Society of Management Accountants. In addition, these accountants need several years of on-the-job training and accreditation by the Certified General Accountants or the Society of Management Accountants. Auditors require education, training and accreditation as indicated for chartered accountants, and possibly, accreditation by the Institute of Internal Auditors. To act as a trustee in bankruptcy proceedings, auditors and accountants must hold a license as a trustee in bankruptcy.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Demand will be strongest for accountants with broad computer software experience, and those who can develop new business areas for firms. Those with a strong financial analysis background, taxation expertise, cost accounting knowledge and international experience are also in demand. With the development of more sophisticated and flexible accounting systems, accountants will focus more on analysing operations rather than just providing financial data. Accounting firms actively recruit at universities to fill junior job vacancies. Employment agencies are also a typical source used by employers. Many professional association Web sites also post job vacancies.

Characteristics of Occupation

Estimated Employment in 2000: 78,200

	(%)
Male	58
Female	42
Full-time	91
Part-time	9
Self-employed	20
Employees	80
Working away from home	87
Working at home	10
No fixed workplace address	3

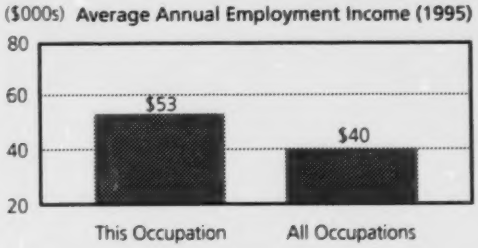
Employment by Region

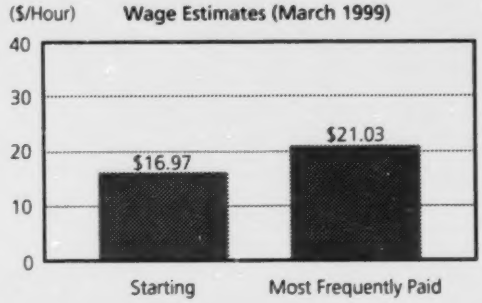
	(%) This Occupation	*(%) All Occupations*
Ottawa	11	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	9	11
Toronto	58	42
London	4	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	1	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

	(%)
Business service	45
Government service	13
Manufacturing	11
Finance and insurance	8

Income and Wages





For more information

Certified General Accountants of Ontario (www.cga-ontario.org)
Institute of Chartered Accountants of Ontario (www.icao.on.ca)
Society of Management Accountants of Ontario (www.cma-ontario.org)
Institute of Internal Auditors (www.theiia.org)

1112 Financial and Investment Analysts

Description

Financial and investment analysts collect and analyse financial marketplace information such as economic forecasts, trading volumes, financial backgrounds of companies, historical performances and future trends of stocks, bonds and other investment instruments to provide financial and investment advice for their company or their company's clients.

Common job titles: Chartered Financial Analyst; Financial Analyst; Financial Consultant; Investment Analyst; Money Market Analyst; Securities Analyst.

Typical employers: banks; financial firms; investment firms; federal and provincial governments; management consulting firms; electric power companies; motor vehicle manufacturers.

Selected Main Duties

Financial and investment analysts perform some or all of the following duties:

- Collect financial and investment information about companies, stocks, bonds and other investments using daily stock and bond reports, economic forecasts, trading volumes, financial periodicals, securities manuals, company financial statements and other financial reports and publications;
- Examine and analyse financial and investment information collected, including profiles of companies, stock and bond prices, yields and future trends and other investment information;
- Provide investment advice and recommendations to clients, senior company officials, pension fund managers, securities agents and associates;
- Prepare company, industry and economic outlooks, analytical reports, briefing notes and correspondence.

Working environment: Financial and investment analysts generally work a standard workweek although irregular hours may be necessary to satisfy client needs and international market requirements.

Education/Training

Employment in this occupation usually requires a bachelor's degree in commerce, business administration or economics, as well as on-the-job training and related industry courses. A program for the globally recognized Chartered Financial Analyst (CFA) designation is administered by the Association for Investment Management and Research and it may be required by some employers. Strong quantitative, computer and analytical skills are essential for this occupation. Detailed knowledge of a particular industry sector or market is an advantage.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow more rapidly than the average for all occupations through the year 2005, as banks and credit institutions expand the range of financial services they offer and markets become more and more global.

Increasingly, financial institutions seek professionals with a broad range of financial sector skills. Many employer job advertisements look for individuals with a variety of financial software skills, as well as communications, thinking and teamwork skills.

Characteristics of Occupation

Estimated Employment in 2000: 11,100

	(%)
Male	58
Female	42
Full-time	94
Part-time	6
Self-employed	5
Employees	95
Working away from home	92
Working at home	7
No fixed workplace address	1

Employment by Region

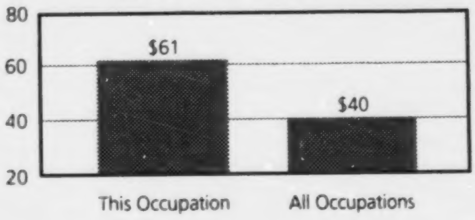
	(%) This Occupation	*(%) All Occupations*
Ottawa	17	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	5	9
Hamilton-Niagara Peninsula	4	11
Toronto	67	42
London	2	5
Windsor-Sarnia	1	5
Stratford-Bruce Peninsula	1	3
Northeast	1	5
Northwest	0	2

Main Industries of Employment

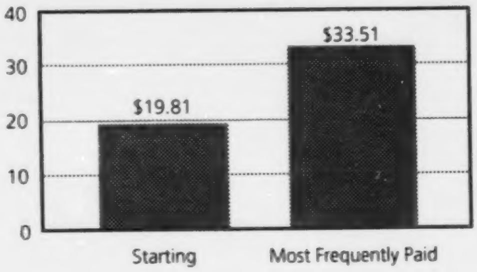
	(%)
Finance and insurance	48
Business service	13
Government service	12
Manufacturing	9

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Toronto Society of Financial Analysts (www.tsfan.org)
Canadian Association of Financial Planners (www.cafp.org)
Canadian Association of Insurance and Financial Advisors (www.caifa.com)
Association for Investment Management and Research (www.aimr.com)

1113 Securities Agents, Investment Dealers and Traders

Description

Securities agents and investment dealers buy and sell stocks, bonds, treasury bills, mutual funds and other securities for individual investors, pension fund managers, banks, trust companies, insurance firms and other establishments. Traders buy and sell stocks, bonds, commodity futures, foreign currencies and other securities at stock exchanges on behalf of investment dealers.

Common job titles: Bond Dealer; Commodities Trader/Floor Trader/Commodity Exchange; Investment Dealer; Mutual Fund Broker; Registered Representative – Investments; Securities Sales Agent; Stock Broker; Supervisor, Registered Representatives.

Typical employers: financial firms; banks and other financial institutions; investment firms; insurance companies; insurance and real estate agencies; management consulting firms.

Selected Main Duties

Securities sales agents and *investment dealers* perform some or all of the following duties:

- Buy and sell stocks, bonds, treasury bills, mutual funds and other securities for individual investors, pension fund managers or companies such as banks, trust companies and insurance firms;
- Provide investment information and advice to clients;
- Review financial periodicals, stock and bond reports, business publications and other material to identify potential investments for clients;
- Monitor clients' investment portfolios and ensure that investment transactions are carried out according to industry regulations.

Traders perform some or all of the following duties:

- Buy and sell stocks, bonds, commodity futures, foreign currencies and other securities at stock exchanges on behalf of investment dealers;
- Develop trading strategies by reviewing investment information and monitoring market conditions from exchange floor and through contact with trading departments of other investment firms, pension fund managers and financial analysts;
- Make bids and offers to buy and sell securities and complete details of sales on exchange trade tickets.

Working environment: The working environment is usually an office. Financial sales, like any sales job, are marked by peaks and valleys in compensation.

Education/Training

A university degree or college diploma in economics, business or another discipline is usually required. Investment, sales or other related industry experience may substitute for post-secondary education. Securities sales representatives and traders require completion of industry investment and sales training programs and the completion of the Canadian Securities Course and the Registered Representative Manual Examination offered by the Canadian Securities Institute. Specialized courses may also be required for those securities sales representatives and traders who want to trade in specific investment products such as securities options and futures contracts. The Chartered Financial Analyst (CFA) designation is recommended for accountants and stockbrokers wishing to enter the mutual fund field, as well as other financial planning services. Licensure by the provincial securities commission in the province of employment is required for securities agents, investment dealers and traders.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. These occupations are sensitive to prevailing economic conditions and the activity level in financial markets and are changing as a result of the growth of on-line brokerages. Demand is increasingly for service-oriented professionals with good working knowledge of computers, data processing and management information systems. Specialized investment expertise is required to work in the area of mergers and acquisitions and the issuing of new bonds.

Some brokerage firms recruit on campus but most also hire through direct application. Financial sales applicants can increase their chances of employment with a new firm by having the potential to bring clients or specialized industry knowledge with them.

Characteristics of Occupation

Estimated Employment in 2000: 17,500

	(%)
Male	66
Female	34
Full-time	92
Part-time	8
Self-employed	9
Employees	91
Working away from home	87
Working at home	11
No fixed workplace address	2

Employment by Region

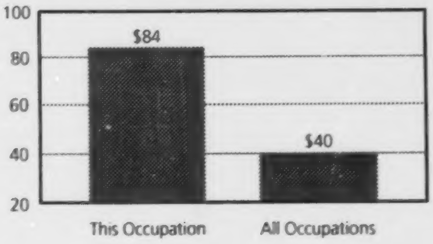
	(%) This Occupation	*(%) All Occupations*
Ottawa	5	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	4	9
Hamilton-Niagara Peninsula	6	11
Toronto	77	42
London	3	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	1	3
Northeast	1	5
Northwest	0	2

Main Industries of Employment

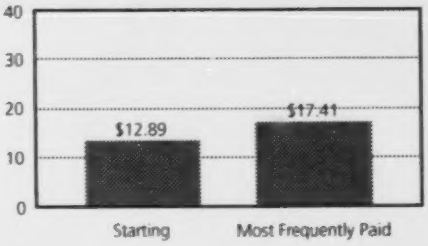
	(%)
Finance and insurance	91
Business service	6

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Canadian Securities Institute (www.csi.ca)
The Investment Funds Institute of Canada (www.ific.ca)
The Canadian Institute of Financial Planning (www.cifp.ca)

1121 Specialists in Human Resources

Description

Specialists in human resources implement and evaluate human resources and labour relations policies, programs and procedures, and advise managers and employees on personnel matters.

Common job titles: Classification Officer; Employee Relations Officer; Job Analyst; Labour Relations Officer; Wage Analyst; Compensation Research Analyst; Conciliator.

Typical employers: labour organizations; federal, provincial and municipal governments; insurance companies; management consulting firms; motor vehicle manufacturers; banks and other financial institutions; electric power companies.

Selected Main Duties

Specialists in human resources perform some or all of the following duties:

- Develop, implement and evaluate personnel and labour relations policies, programs and procedures;
- Advise managers and employees on the interpretation of personnel policies, benefit programs and collective agreements;
- Negotiate collective agreements on behalf of employers or workers, and mediate labour disputes and grievances;
- Research and prepare occupational classifications, job descriptions and salary scales;
- Administer benefit, employment equity and affirmative action programs and maintain related records systems;
- Co-ordinate employee performance and appraisal programs;
- Research employee benefit and health and safety practices and recommend changes or modifications to existing policies.

Working environment: Specialists in human resources work in an office environment. A standard 35 to 40-hour workweek is the norm; however, many put in longer hours.

Education/Training

A university degree or college diploma in a field related to personnel management, such as business administration, industrial relations, commerce or psychology, as well as, the completion of a professional development program in personnel administration is increasingly required. Some experience in a clerical or administrative position related to personnel administration may also be required.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow as fast as the average for all occupations through 2005. Employment growth could be restrained by the widespread use of computerized human resources information systems that make workers more productive. However, many job openings will become available each year resulting from the need to replace workers who retire.

Human resources specialists become increasingly important to the success of an organization, helping it to restructure, improve performance and plan for job-specific training programs to assist staff to acquire new skills. The human resources specialist is also expected to promote change in leadership style in organizations and improve working relations between employees and management.

Computerized human resource information systems to maintain employee information will increase the skill requirements of these professionals.

Characteristics of Occupation

Estimated Employment in 2000: 11,600

	(%)
Male	43
Female	57
Full-time	93
Part-time	7
Self-employed	3
Employees	97
Working away from home	93
Working at home	5
No fixed workplace address	2

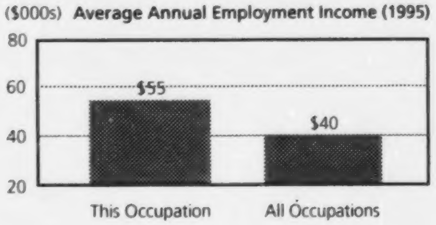
Employment by Region

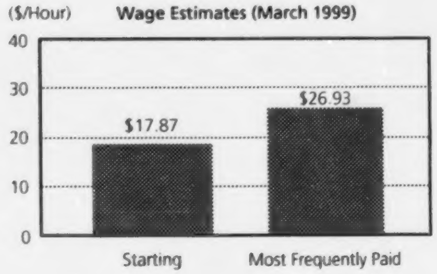
	(%) This Occupation	*(%) All Occupations*
Ottawa	22	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	8	11
Toronto	46	42
London	4	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	1	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

	(%)
Government service	27
Membership organization	18
Manufacturing	14
Business service	12
Finance and insurance	9

Income and Wages





For more information

Human Resources Professionals Association of Ontario (www.hrpao.org)
International Personnel Management Association – Canada (www.ipma-canada.com)

1221 Administrative Officers

Description

Administrative officers oversee and implement administrative procedures, establish work priorities, and co-ordinate the acquisition of administrative services such as office space, supplies and security services.

Common job titles: Co-ordinator – Office Services; Liaison Officer; Office Administrator; Office Manager; Planning Officer.

Typical employers: offices of physicians, surgeons and dentists; banks and other financial institutions; business services firms; insurance companies; insurance and real estate agencies; architectural, engineering and other scientific companies; federal, provincial and municipal governments.

Selected Main Duties

Administrative officers perform some or all of the following duties:

- Oversee and co-ordinate office administrative procedures and review, evaluate and implement new procedures;
- Establish work priorities, delegate work to office support staff, and ensure deadlines are met and procedures are followed;
- Co-ordinate and plan for office services, such as accommodation, relocations, equipment, supplies, forms, disposal of assets, parking, maintenance and security services;
- Assist in preparation of operating budget and maintain inventory and budgetary controls;
- Assemble data and prepare periodic and special reports, manuals and correspondence.

Working environment: Administrative officers usually work in an office environment.

Education/Training

Employment in this field increasingly requires a university degree or college diploma in business or public administration. Experience in a senior clerical or executive secretarial position related to office administration may also provide an entry into this occupation.

Employment Prospects

Over the next five years: Good

While job growth will create new positions, the majority of job openings will stem from replacement needs as older workers retire. Administrative functions in middle management of larger companies have already been affected by downsizing, outsourcing and streamlining of business services. Technological change also has an effect on this occupational group due to the increased use of specialized computer systems. However, individuals with specialized skills in data communication, retrieval and manipulation, and with good communication and teamwork skills may be in demand.

Characteristics of Occupation

Estimated Employment in 2000: 70,700

	(%)
Male	22
Female	78
Full-time	88
Part-time	12
Self-employed	3
Employees	97
Working away from home	92
Working at home	7
No fixed workplace address	1

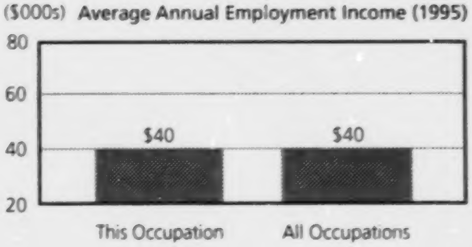
Employment by Region

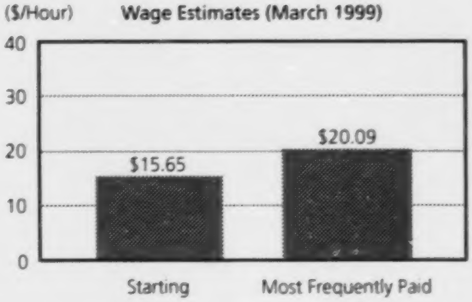
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	10	11
Toronto	50	42
London	5	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	2	3
Northeast	4	5
Northwest	2	2

Main Industries of Employment

	(%)
Business service	14
Health and social service	14
Manufacturing	13
Government service	10
Wholesale trade	9

Income and Wages





For more information

International Association of Administrative Professionals (www.iaap-hq.org)
Institute of Chartered Secretaries and Administrators in Canada (www.icsacanada.org)

1222 Executive Assistants

Description

Executive assistants co-ordinate administrative procedures, public relations activities and research and analysis functions for members of legislative assemblies, ministers, deputy ministers, corporate officials and executives, committees and boards of directors.

Common job titles: Committee Clerk; Corporate Secretary; Executive Assistant; Legislative Assistant.

Typical employers: federal, provincial and municipal governments; universities; insurance companies; business services firms; elementary and secondary schools.

Selected Main Duties

Executive assistants perform some or all of the following duties:

- Establish and co-ordinate administrative policies and procedures for officials, committees and boards of directors;
- Analyse incoming and outgoing memoranda, submissions and reports and prepare and co-ordinate the preparation and submission of summary briefs and reports to the executive, committees and boards of directors;
- Prepare agendas and make arrangements for committee, board and other meetings;
- Conduct research, compile data and prepare papers for consideration and presentation by the executive, committees and boards of directors;
- Meet with individuals, special interest groups and others on behalf of the executive, committees and boards of directors to discuss issues and assess and recommend various courses of action;
- Liaise with departmental and corporate officials and with other organizations and associations on behalf of the executive, committees and boards of directors.

Working environment: Executive assistants usually work in office surroundings though they often travel to meetings and promotional functions.

Education/Training

Increasingly a bachelor's degree in public administration, political science or a related discipline is required. Experience in a related administrative occupation may also be required.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. In addition to job openings arising from growth, a large number of openings will stem from the need to replace workers who retire.

The executive assistant's position is at the top of the clerical hierarchy. It is, therefore, often used to provide developmental opportunities for promising staff for management positions, because it provides a broad overview of the various aspects of the executive function. The growing use of new types of office automation will continue to limit the demand for clerical workers. However, many executive assistants' job duties are of a personal, interactive nature and not easily automated. This occupational group will continue to play a key role in the office activities of most organizations.

Characteristics of Occupation

Estimated Employment in 2000: 14,100

	(%)
Male	13
Female	87
Full-time	93
Part-time	7
Self-employed	1
Employees	99
Working away from home	97
Working at home	2
No fixed workplace address	1

Employment by Region

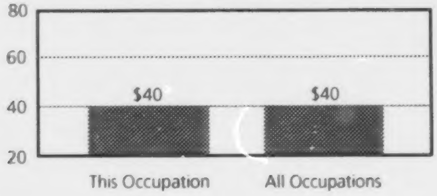
	(%) This Occupation	*(%) All Occupations*
Ottawa	15	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	5	11
Toronto	61	42
London	3	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	1	3
Northeast	2	5
Northwest	1	2

Main Industries of Employment

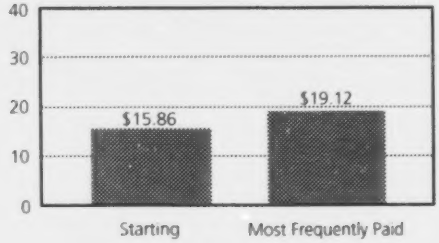
	(%)
Government service	24
Manufacturing	13
Business service	12
Finance and insurance	11
Health and social service	8

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Association of Administrative Assistants (www.aaa.ca)

Institute of Chartered Secretaries and Administrators in Canada (www.icsacanada.org)

1224 Property Administrators

Description

Property administrators perform administrative duties and co-ordinate activities related to the management and rental of investment property and real estate on behalf of property owners.

Common job titles: Accommodation Officer; Government Property Manager; Leasing Co-ordinator – Property; Property Administrator; Property Manager; Property Officer.

Typical employers: operators of buildings and dwellings; insurance and real estate agencies; provincial and municipal governments.

Selected Main Duties

Property administrators perform some or all of the following duties:

- Negotiate or approve rental or lease of various properties in a portfolio on behalf of property owners and ensure that terms of lease agreement are met;
- Prepare and administer contracts for provision of property services, such as cleaning and maintenance, security services and alarm systems;
- Co-ordinate the implementation of repairs, maintenance and renovations carried out on buildings and monitor progress and cost of work for property owners;
- Compile and maintain records on operating expenses and income and prepare reports;
- Ensure that calls received from clients or tenants are acted upon;
- Hire and supervise rental agents, property clerks and building superintendents.

Working environment: Working time for property administrators is divided between office environment and clients' premises.

Education/Training

Completion of secondary school is required. Several years of administrative experience as a property clerk, contract clerk, or administrative officer are also usually srequired. Property administrators usually receive on-the-job training, and complete training courses through the real estate agency or company for which they work.

Employment Prospects

Over the next five years: Good

While job growth will create new positions, the majority of job openings will stem from replacement needs as older workers retire. Opportunities for property administrators move in tandem with the residential housing and commercial property markets. With the continued growth in the number of older people, there will be an increased demand for various types of suitable housing such as assisted living arrangements and retirement communities. Individuals with experience or knowledge of health care facilities may have particularly good job prospects.

Characteristics of Occupation

Estimated Employment in 2000: 16,600

	(%)
Male	50
Female	50
Full-time	80
Part-time	20
Self-employed	16
Employees	84
Working away from home	72
Working at home	22
No fixed workplace address	6

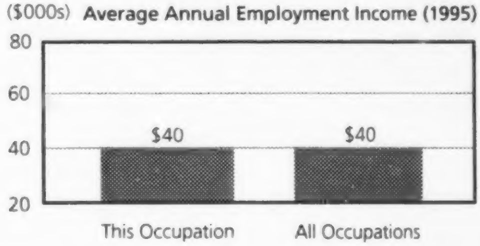
Employment by Region

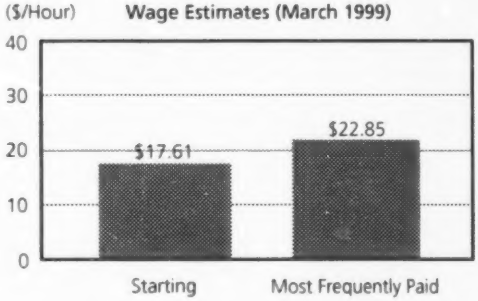
	(%) This Occupation	*(%) All Occupations*
Ottawa	6	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	10	11
Toronto	55	42
London	7	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	1	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

	(%)
Real estate operator and insurance agent	79
Government service	6

Income and Wages





For more information

BOMI Institute (www.bomi-edu.org)

Institute of Housing Management, Algonquin College (www.algonquinc.on.ca/ce)

1225 Purchasing Agents and Officers

Description

Purchasing agents and officers purchase general and specialized equipment, materials and business services for use or for further processing by their establishment.

Common job titles: Contract Management Officer; Procurement Officer; Purchasing Agent; Supply Officer – Government.

Typical employers: federal, provincial and municipal governments; machinery and equipment manufacturers; advertising firms; defence services; motor vehicle parts manufacturers; hospitals; electronic equipment manufacturers.

Selected Main Duties

Purchasing agents and officers perform some or all of the following duties:

- Purchasing general and specialized equipment, materials or business services for use or for further processing by their establishment;
- Assess requirements of an establishment and develop specifications for equipment, materials and supplies to be purchased;
- Invite tenders, consult with suppliers and review quotations;
- Determine contract terms and conditions, award contracts or recommend contract awards;
- Establish delivery schedules, monitor progress and contact clients and suppliers to resolve problems;
- Hire, train or supervise purchasing clerks.

Working environment: Purchasing agents and officers work in an office environment with occasional visits to suppliers and trade shows.

Education/Training

A bachelor's degree or college diploma in business administration, commerce or economics is usually required. Purchasing agents and officers purchasing specialized materials or business services may require a related university degree or college diploma. For example, a bachelor's degree or college diploma in engineering may be required for purchasers of industrial products. Previous experience as a purchasing clerk or as an administrative clerk may be required. Certification from the Purchasing Management Association of Canada or the National Institute of Governmental Purchasing may be advantageous. Well developed negotiation skills are important.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. This occupation is found across a broad range of industries. It is being affected by the introduction of various computer systems to track business activities and to re-order parts and supplies automatically when inventories fall too low.

The increased use of business-to-business e-commerce without using the services of the purchasing office may restrict demand for purchasing agents within governments and many manufacturing firms. Also, limited sourcing and long-term contracting have allowed companies to negotiate less frequently and with fewer suppliers. Purchasing officers with specialized computer skills in setting up and using computerized inventory control and ordering systems will be in demand.

Characteristics of Occupation

Estimated Employment in 2000: 15,000

	(%)
Male	54
Female	46
Full-time	97
Part-time	3
Self-employed	2
Employees	98
Working away from home	98
Working at home	2
No fixed workplace address	0

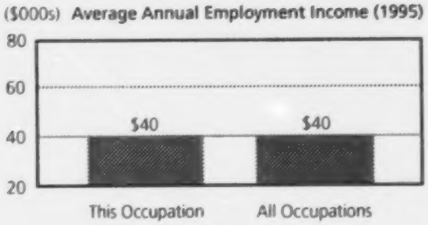
Employment by Region

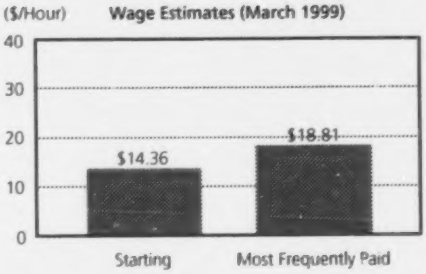
	(%) This Occupation	*(%) All Occupations*
Ottawa	12	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	11	9
Hamilton-Niagara Peninsula	10	11
Toronto	46	42
London	5	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	2	3
Northeast	3	5
Northwest	2	2

Main Industries of Employment

	(%)
Manufacturing	45
Wholesale trade	11
Government service	10
Business service	8

Income and Wages





For more information

Purchasing Management Association of Canada (www.pmac.ca)
Ontario Institute of PMAC (www.ontarioinstitute.com)
National Institute of Governmental Purchasing (www.nigp.org)

1231 Bookkeepers

Description

Bookkeepers maintain complete sets of books, keep records of accounts, verify the procedures used for recording financial transactions, and provide personal bookkeeping services. The term bookkeeper refers to a person who can complete a full set of books up to and including a trial balance. Large and medium companies tend to employ bookkeepers on a full-time basis; small firms tend to employ freelancers or firms that provide bookkeeping services.

Common job titles: Accounting Bookkeeper; Bookkeeper.

Typical employers: accounting and bookkeeping firms; agricultural companies; residential building developers; motor vehicle repair shops; offices of physicians, surgeons and dentists; food stores, law firms; food services.

Selected Main Duties

Bookkeepers perform some or all of the following duties:

- Keep financial records and establish, maintain and balance various accounts using manual and computerized bookkeeping systems;
- Post journal entries and reconcile accounts, prepare trial balance of books, maintain general ledgers and prepare financial statements;
- Calculate and prepare cheques for payrolls and for utility, tax and other bills;
- Complete and submit tax remittance forms, workers' compensation forms, pension contribution forms and other government documents;
- Prepare tax returns and perform other personal bookkeeping services;
- Prepare other statistical, financial and accounting reports.

Working environment: Bookkeepers work in an office environment. During the tax season, bookkeepers may work long hours.

Education/Training

Completion of a college program in accounting, bookkeeping or a related field, completion of two years (first level) of a recognized professional accounting program (e.g., Chartered Accounting, Certified General Accounting) or courses in accounting or bookkeeping combined with several years of experience as a financial or accounting clerk are required.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to increase more slowly than the average for all occupations through 2005. However, because of the large size of this occupational group, the need to replace workers who retire will produce thousands of additional job openings yearly. The use of computerized accounting systems is widespread, even in small offices. Bookkeepers with specialized computer skills and those working towards recognized accounting designations are expected to be more successful in the labour market.

In small offices, the bookkeeping function is increasingly being integrated with other clerical support duties. Most vacancies are filled by informal networks or direct application. Employers also recruit via newspaper ads, and private and public employment agencies.

Characteristics of Occupation

Estimated Employment in 2000: 49,400

	(%)
Male	11
Female	89
Full-time	58
Part-time	42
Self-employed	17
Employees	83
Working away from home	66
Working at home	32
No fixed workplace address	2

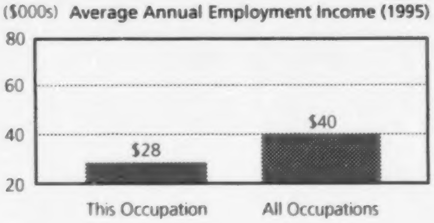
Employment by Region

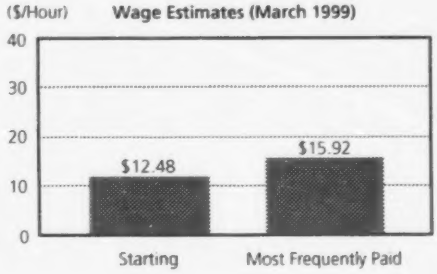
	(%) This Occupation	*(%) All Occupations*
Ottawa	6	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	4	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	13	11
Toronto	37	42
London	6	5
Windsor-Sarnia	7	5
Stratford-Bruce Peninsula	4	3
Northeast	7	5
Northwest	3	2

Main Industries of Employment

	(%)
Business service	24
Retail trade	17
Construction	10
Manufacturing	8
Wholesale trade	8

Income and Wages





For more information

Certified General Accountants of Canada (www.cga-canada.org)
Society of Management Accountants of Canada (www.cma-canada.org)
Institute of Chartered Accountants of Ontario (www.icao.on.ca)

1233 Insurance Adjusters and Claims Examiners

Description

Insurance adjusters investigate insurance claims and determine the amount of loss or damages covered by insurance policies. They are employed in claims departments of insurance companies or as independent adjusters. Insurance claims examiners examine claims investigated by insurance adjusters and authorize payments. They are employed at head offices or branches of insurance companies.

Common job titles: Adjuster; Claim Examiner; Insurance Adjuster.

Typical employers: insurance companies; insurance and real estate agencies; provincial government.

Selected Main Duties

Insurance adjusters perform some or all of the following duties:

- Investigate circumstances surrounding insurance claims to determine validity of claim;
- Inspect automobile, home or other property damage;
- Take statements and consult with claimants, accident witnesses, doctor and other relevant individuals and examine records or reports;
- Determine amount of loss or damages covered by insurance policies;
- Negotiate settlement of claims;
- Prepare adjustment reports.

Insurance claims examiners perform some or all of the following duties:

- Review, examine, calculate and authorize insurance claims investigated by insurance adjusters;
- Examine adjusters' reports and similar insurance claims or precedents to determine extent of insurance coverage;
- Ensure claims are valid and settlements are made according to company practices and procedures;
- Consult lawyers, doctors or other relevant individuals to discuss insurance claims;
- Approve automobile, fire, life, disability, dental or other insurance claims.

Working environment: The investigative aspect of the job sometimes involves evening and weekend work in order to meet clients outside regular business hours.

Education/Training

A bachelor's degree, college diploma or some post-secondary education or several years of experience as a clerk in the claims department or other general insurance experience are required. Several years of on-the-job training and completion of insurance industry courses and training programs may also be required. Independent adjusters require a provincial license issued by the Superintendent of Insurance in Ontario. Completion of educational programs through the Insurance Institute of Canada or its provincial counterpart entitles insurance adjusters and claims examiners to professional recognition as an Associate of the Insurance Institute of Canada (AIIC).

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Many job openings will result from the need to replace workers who retire.

The demand for insurance adjusters and claims examiners will continue to arise because of the increased need for property and casualty insurance activity resulting from growth in population, incomes and urban concentrations.

Insurance adjusters and claims examiners work with computerized accounting and insurance processing systems. This requires specialized computer skills.

Characteristics of Occupation

Estimated Employment in 2000: 8,800

	(%)
Male	39
Female	61
Full-time	95
Part-time	5
Self-employed	2
Employees	98
Working away from home	92
Working at home	6
No fixed workplace address	2

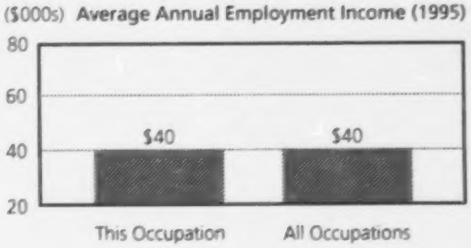
Employment by Region

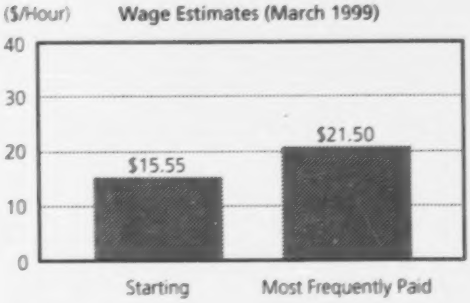
	(%) This Occupation	*(%) All Occupations*
Ottawa	8	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	10	11
Toronto	56	42
London	5	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	1	3
Northeast	2	5
Northwest	1	2

Main Industries of Employment

	(%)
Insurance	59
Insurance and real estate agent	29

Income and Wages





For more information

Insurance Institute of Canada (www.iic-iac.org)

1234 Insurance Underwriters

Description

Insurance underwriters review and evaluate insurance applications to determine insurance risks, insurance premiums and extent of insurance coverage according to company policies. Insurance underwriters are employed at head and branch offices of insurance companies.

Common job titles: Insurance Underwriter; Property Underwriter.

Typical employers: insurance companies; insurance and real estate agencies.

Selected Main Duties

Insurance underwriters perform some or all of the following duties:

- Review individual and group applications for automobile, fire, health, liability, life, property, marine, aircraft and other insurance;
- Evaluate new and renewal applications to determine insurance risks, insurance premiums, extent of insurance coverage and other conditions of the insurance contract using medical reports, rate tables and other documents and reference materials;
- Approve sale of insurance policies and ensure compliance with government regulations;
- Provide recommendations on individual or group insurance plan designs;
- Provide underwriting advice and answer inquiries from clients and from insurance agents, consultants and other company personnel;
- Prepare underwriting reports.

Working environment: Work is usually conducted in an office environment.

Education/Training

Completion of secondary school and some general insurance experience or a bachelor's degree, college diploma or some post-secondary education is required. Several years of experience and completion of educational programs through the Insurance Institute of Canada or a provincial counterpart entitles insurance underwriters to professional recognition as an Associate of the Insurance Institute of Canada (AIIC) or Fellow of the Insurance Institute of Canada (FIIC). The Canadian Association of Insurance and Financial Advisors grants Chartered Life Underwriter, Chartered Financial Consultant, and Certified Financial Planner designations.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. The insurance industry is undergoing considerable restructuring in Canada. An increased number of organizations are able to engage in the insurance business. As a result, there has been an increase in the demand for this occupation. Demand, however, will lessen as the number of firms operating in this sector stabilizes.

The tendency to computerize and streamline operations will require additional, specialized computer skills.

Characteristics of Occupation

Estimated Employment in 2000: 6,200

	(%)
Male	27
Female	73
Full-time	95
Part-time	5
Self-employed	1
Employees	99
Working away from home	97
Working at home	1
No fixed workplace address	2

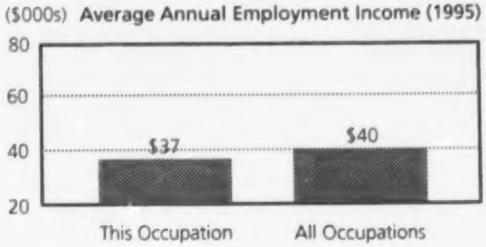
Employment by Region

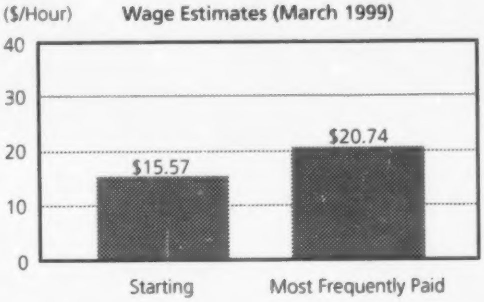
	(%) This Occupation	*(%) All Occupations*
Ottawa	5	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	9	11
Toronto	65	42
London	6	5
Windsor-Sarnia	0	5
Stratford-Bruce Peninsula	1	3
Northeast	1	5
Northwest	0	2

Main Industries of Employment

	(%)
Insurance	75
Insurance and real estate agent	22

Income and Wages





For more information

Canadian Association of Insurance and Financial Advisors (www.caifa.com)
Insurance Institute of Canada (www.iic-iac.org)

1241 Secretaries (Except Legal and Medical)

Description

Secretaries perform a variety of administrative duties in support of managerial and professional employers.

Common job titles: Executive Secretary; Private Secretary; Secretary; Technical Secretary; Administrative Assistant.

Typical employers: banks and other financial institutions; insurance companies; insurance and real estate agencies; elementary and secondary schools; universities; federal, provincial and municipal governments; business services firms.

Selected Main Duties

Secretaries perform some or all of the following duties:

- Type correspondence, reports, minutes, invoices and related material;
- Revise and maintain data in spreadsheets;
- Produce reports using the information in databases;
- Proof-read and format correspondence and reports and presentations;
- Open and distribute incoming mail and other material and co-ordinate the flow of information internally and with other departments and organizations;
- Schedule and confirm employer's appointments and meetings;
- Answer telephone inquiries and relay telephone calls;
- Set up and maintain information filing systems;
- Greet visitors, ascertain nature of business and direct visitors to employer or appropriate person;
- Record and prepare minutes of meetings;
- Arrange employer's travel schedules and make reservations;
- Supervise other office workers.

Working environment: The work environment is dependent on the specific nature or location of the job. Secretaries usually work in an office environment although with advances in electronic communications, telework from an offsite location may be possible.

Education/Training

Completion of secondary school is usually required. Increasingly completion of a one or two-year college or other program for secretaries, previous clerical experience, and familiarity with the most common software programs for word processing, graphics and spreadsheets are also required. Additional training may be necessary to gain knowledge of specific vocabulary or understanding of the nature of business or products, e.g., insurance.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to decline through the year 2005 due to the widespread application of new office automation. Despite this projected decline, a substantial number of job openings will be created each year from the need to replace workers who retire because of the large size of this occupational group.

Experienced secretaries with specialized skills in the latest office software applications are expected to be more successful in the labour market. As well, the expanded role for secretaries may enhance career opportunities for some.

Characteristics of Occupation

Estimated Employment in 2000: 69,400

	(%)
Male	2
Female	98
Full-time	77
Part-time	23
Self-employed	2
Employees	98
Working away from home	90
Working at home	8
No fixed workplace address	2

Employment by Region

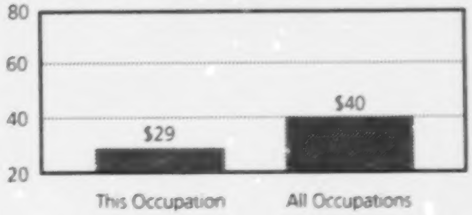
	(%) This Occupation	*(%) All Occupations*
Ottawa	11	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	10	11
Toronto	44	42
London	5	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	2	3
Northeast	6	5
Northwest	2	2

Main Industries of Employment

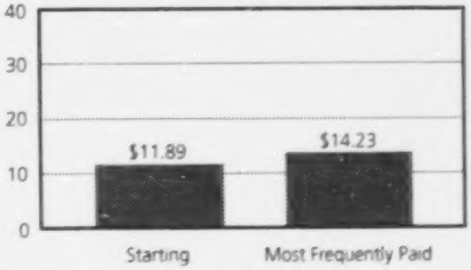
	(%)
Educational service	17
Business service	13
Manufacturing	10
Health and social service	10
Government service	10
Wholesale trade	6

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Association of Administrative Assistants (www.aaa.ca)

International Association of Administrative Professionals (Halifax-Dartmouth Chapter)
(www.chebucto.ns.ca/Commerce/ IAAP)

1242 Legal Secretaries

Description

Legal secretaries perform a variety of secretarial and administrative duties.

Common job titles: Estate Secretary; Legal Secretary; Litigation Secretary; Real Estate Secretary.

Typical employers: law firms; insurance and real estate agencies; land title offices, municipal, provincial and federal courts and governments.

Selected Main Duties

Legal secretaries perform some or all of the following duties:

- Type correspondence and legal documents, such as deeds, wills, affidavits and briefs, from hand-written copy, shorthand and machine dictation, using typewriters, word processors and computers;
- Schedule appointments, meetings and conferences for employer;
- Set up and maintain filing systems, utilizing knowledge of legal records and procedures and frequently controlling confidential materials and documents;
- Open and distribute incoming mail and other material and co-ordinate the flow of information internally and with other departments or organizations; may operate electronic mail systems;
- Review and proof-read outgoing documents and correspondence to ensure compliance with legal procedures and grammatical usage;
- May attend court, meetings or conferences to take notes, minutes and dictation;
- May perform other general office work as required including preparing financial statements and supervising office workers.

Working environment: Legal secretaries work in law offices, legal centres or other related locations.

Education/Training

Completion of a one or two-year college or other program for legal secretaries is increasingly required. Experienced legal secretaries may also advance to become paralegals.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to increase more slowly than the average for all occupations through the year 2005, with most job openings occurring as older workers retire. Increasing use of the Internet and computerized legal databases, billing systems and other information technologies means that legal secretaries with a variety of computer applications skills will be more successful in the labour market.

Characteristics of Occupation

Estimated Employment in 2000: 11,800

	(%)
Male	1
Female	99
Full-time	85
Part-time	15
Self-employed	3
Employees	97
Working away from home	97
Working at home	2
No fixed workplace address	1

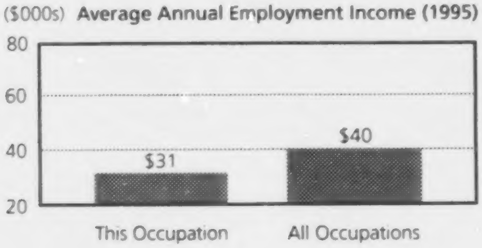
Employment by Region

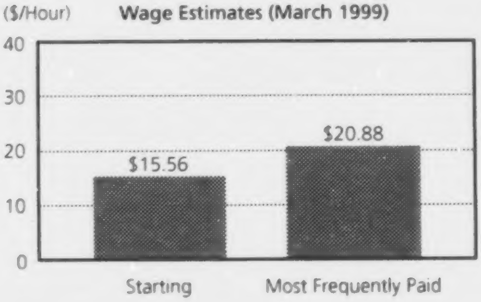
	(%) This Occupation	*(%) All Occupations*
Ottawa	8	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	10	11
Toronto	53	42
London	4	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	2	3
Northeast	4	5
Northwest	1	2

Main Industries of Employment

	(%)
Business service	87
Government service	5

Income and Wages





For more information

Legal Secretaries International Inc. (www.compassnet.com/legalsec)

National Federation of Paralegal Associations (www.paralegals.org)

1243 Medical Secretaries

Description

Medical secretaries perform a variety of secretarial and administrative duties. The term medical secretary used in its proper context refers to a person who is employed by a medical specialist. The medical secretary is required to produce medical reports, using the medical terms of the specialist, which are then sent to the patient's own physician.

Common job titles: Medical Secretary; Ward Secretary.

Typical employers: offices of physicians, surgeons and dentists; hospitals; offices of health practitioners; non-institutional health services; medical laboratories.

Selected Main Duties

Medical secretaries perform some or all of the following duties:

- Schedule and confirm medical appointments and receive and communicate messages for doctors and patients;
- Type medical records, reports, articles, case histories and correspondence from machine dictation, shorthand and hand-written notes using typewriters, word processors and computers;
- Interview patients in order to complete forms, documents and case histories;
- Complete insurance and other claim forms;
- Initiate and maintain confidential medical files and records;
- Prepare financial statements and handle billing procedures;
- Order supplies and maintain inventory.

Working environment: Medical secretaries work in medical offices, hospitals or other related medical centres. They usually work in an increasingly computerized office environment.

Education/Training

Completion of a one or two-year college program or other specialized courses for medical secretaries is increasingly required. Working in the medical field requires the secretary to be acquainted with specialized medical terminology.

Employment Prospects

Over the next five years: Good

In contrast with most other secretarial occupations, employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005 due to growth in health service industries. In addition, many job openings will be created each year from the need to replace workers who retire.

The increasing use of computerized medical records systems, billing systems and other office equipment technology in medical offices and clinics means that medical secretaries with strong computer skills will have better employment opportunities.

Characteristics of Occupation

Estimated Employment in 2000: 12,800

	(%)
Male	1
Female	99
Full-time	68
Part-time	32
Self-employed	1
Employees	99
Working away from home	95
Working at home	4
No fixed workplace address	1

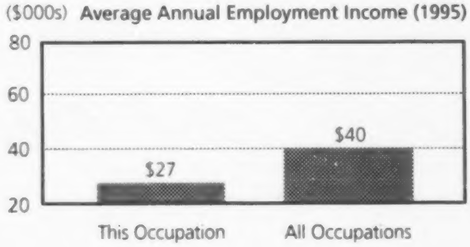
Employment by Region

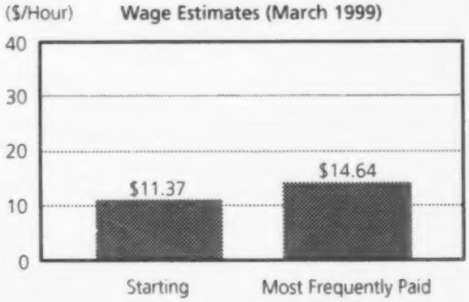
	(%) This Occupation	*(%) All Occupations*
Ottawa	11	10
Kingston-Pembroke	5	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	11	11
Toronto	44	42
London	6	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	2	3
Northeast	6	5
Northwest	2	2

Main Industries of Employment

	(%)
Health and social service	97

Income and Wages





For more information

Ontario Medical Secretaries Association (www.anl.com/pages/omsa.htm)

1411 General Office Clerks

Description

General office clerks type and file correspondence, reports, statements and other material, operate office equipment, answer telephones and perform clerical duties of a general nature according to established procedures. Entry level clerical jobs are increasingly centered on telephone work rather than the manipulation of paper. Many clerical jobs in both the public and private sectors are being recategorized from clerical to sales and customer service jobs.

Common job titles: Administrative Assistant; General Office Clerk; Office Assistant; Office Clerk.

Typical employers: federal, provincial and municipal governments; business services firms; telecommunication companies; insurance companies; general merchandise stores; electric power companies; hospitals.

Selected Main Duties

General office clerks perform some or all of the following duties:

- Type and proof-read correspondence, reports, statements, invoices, forms and other documents, from notes or dictaphone, using word processors and computers;
- Receive and forward telephone or counter inquiries to appropriate person and provide general information to clients and the public;
- Photocopy and collate documents for distribution, mailing and filing;
- Maintain and update manual or computerized filing, inventory, mailing and database systems;
- Open, sort and route incoming mail;
- Send and receive messages using facsimile machines;
- Perform routine bookkeeping tasks such as preparing invoices and bank deposits;
- Sort, process and verify applications, receipts, expenditures, forms and other documents.

Working environment: In smaller offices, the nature of the work is varied, while in larger offices it tends to be more specialized and repetitive. Most of the work is done at a desk.

Education/Training

Completion of secondary school or college business or commercial courses is usually required, as well as, the ability to operate a desk top computer.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to decline through the year 2005 due to the widespread application of new office automation. Despite this projected decline, a substantial number of job openings will be created each year from the need to replace workers who retire because of the large size of this occupational group. Managers and employees increasingly are using such technologies as personal computers, electronic mail and automated voice mail systems. This trend reduces the need for clerks.

Improvements in communication and access to information as a result of the Internet and e-mail are affecting the skills used by general office clerks. There will be an ongoing need for training in the use of new software as computerization increases. There will also be a need for skill in finding relevant and timely information from a broad number of sources.

Characteristics of Occupation

Estimated Employment in 2000: 72,000

	(%)
Male	18
Female	82
Full-time	71
Part-time	29
Self-employed	3
Employees	97
Working away from home	89
Working at home	9
No fixed workplace address	2

Employment by Region

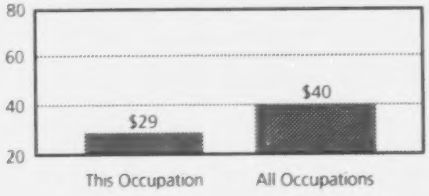
	(%) This Occupation	*(%) All Occupations*
Ottawa	12	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	9	11
Toronto	46	42
London	5	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	2	3
Northeast	5	5
Northwest	2	2

Main Industries of Employment

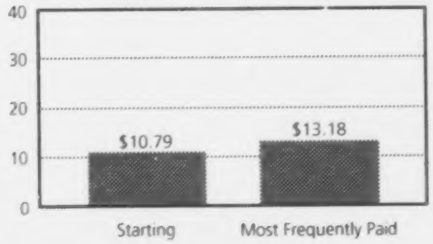
	(%)
Government service	15
Business service	12
Manufacturing	12
Health and social service	9
Retail trade	8

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Office Workers Career Centre (www.clericalworkerscentre.org)

1414 Receptionists and Switchboard Operators

Description

Receptionists and switchboard operators greet people arriving at offices, hospitals and other establishments, direct visitors to appropriate person or service, answer and forward telephone calls, take messages, schedule appointments and perform other clerical duties.

Common job titles: Admitting Clerk; Answering Service Operator; Business Receptionist; Dental Receptionist; Hospital Admitting Clerk; Medical Receptionist; Reception Clerk; Receptionist; Switchboard Operator; Telereceptionist.

Typical employers: offices of physicians, surgeons and dentists; hospitals; offices of health practitioners; insurance and real estate agencies; business services firms; law firms; insurance companies; municipal governments.

Selected Main Duties

The following is a summary of the main duties for some occupations in this group:

- *Receptionists* greet people coming into offices and other establishments, direct them to the appropriate contacts or services, and provide basic information;
- *Hospital admitting clerks* interview patients to obtain and process information required to provide hospital and medical services;
- *Medical and dental receptionists* greet patients, schedule appointments, receive and record payment for services, and direct patients to appropriate areas;
- *Switchboard operators* operate a telephone system or switchboard to answer, screen and forward telephone calls, taking messages and providing basic information as required;
- *Answering service operators* answer telephones and record and relay messages.

Working environment: Receptionists generally work in a reception area although in small businesses and in some accommodation establishments, they may be located at the front of the general office.

Education/Training

Completion of secondary school is usually required. On-the-job training may be provided.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to decline through the year 2005 due to the widespread application of advanced office automation. Despite this projected decline, a substantial number of job openings will be created each year from the need to replace workers who retire because of the large size of this occupational group.

The receptionist position is usually an entry-level job with hiring occurring directly out of high school. However, as the traditional receptionist functions diminish, most receptionist jobs now include other responsibilities. Advances in computer technology will lead to receptionists and switchboard operators to use a wide array of computer applications. Along with greeting people in person or on the phone and directing their requests, receptionists are now usually required to handle some secretarial or clerical work.

Characteristics of Occupation

Estimated Employment in 2000: 54,700

	(%)
Male	5
Female	95
Full-time	63
Part-time	37
Self-employed	1
Employees	99
Working away from home	96
Working at home	3
No fixed workplace address	1

Employment by Region

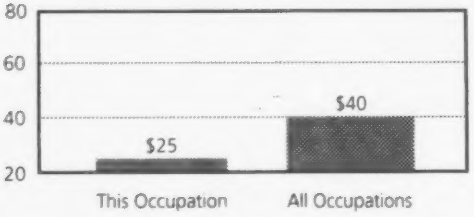
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	11	11
Toronto	49	42
London	5	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	2	3
Northeast	4	5
Northwest	2	2

Main Industries of Employment

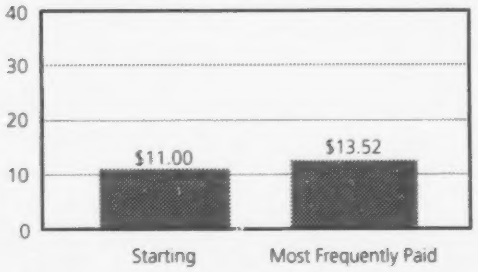
	(%)
Health and social service	32
Business service	12
Manufacturing	8
Wholesale trade	6
Retail trade	6

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Office Workers Career Centre (www.clericalworkerscentre.org)

1421 Computer Operators

Description

Computer operators run computer equipment, produce computer generated reports, monitor the operation of computer systems and networks, and co-ordinate their use.

Common job titles: Computer Operator; Computer Tape Librarian; Junior Computer Operator; Magnetic Tape Operator; Master Console Operator; Network Controller; Network Operator; Peripheral Operator; System Operator.

Typical employers: computer service firms; banks and other financial institutions; federal, provincial and municipal governments; insurance companies; telecommunication companies; business services firms.

Selected Main Duties

Computer operators perform some or all of the following duties:

- Operate computer equipment such as terminals, tape drives, disk drives and printers;
- Operate master consoles to monitor the operation of computer systems and networks;
- Load computer tapes and disks and install software and printer paper and forms;
- Operate spreadsheet programs and other types of software to load and manipulate data and to produce reports;
- Co-ordinate and schedule the use of computer terminals and networks;
- Report computer malfunctions to computer maintenance technicians;
- Distribute computer output to users.

Working environment: Persons in this occupation work with a variety of electronic machinery. Shift work and overtime are occasionally required.

Education/Training

Employment in this area usually requires the completion of secondary school and college or other courses in computer operation or network administration.

Employment Prospects

Over the next five years: Limited

Employment for this occupation is expected to decline through the year 2005.

Increasing use of microcomputers and networks, rather than mainframe computers, is likely to continue to have an unfavourable impact on demand for computer operators.

In the future, computer operators will be dealing more and more with users in distant locations. This trend will enhance the need for effective communication skills.

Characteristics of Occupation

Estimated Employment in 2000: 12,000

	(%)
Male	54
Female	46
Full-time	87
Part-time	13
Self-employed	3
Employees	97
Working away from home	95
Working at home	3
No fixed workplace address	2

Employment by Region

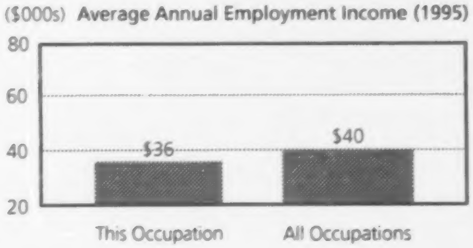
	(%) This Occupation	*(%) All Occupations*
Ottawa	13	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	9	11
Toronto	54	42
London	4	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	2	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

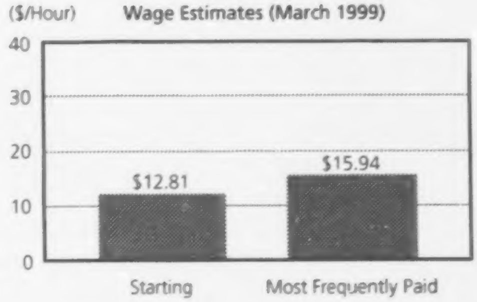
	(%)
Business service	19
Manufacturing	18
Finance and insurance	13
Government service	13
Communication and other utilities	7

Income and Wages

Average Annual Employment Income (1995)



Wage Estimates (March 1999)



For more information

Office Workers Career Centre (www.clericalworkerscentre.org)

1431 Accounting and Related Clerks

Description

This group includes clerks who calculate, prepare and process bills, invoices, accounts payable and receivable, budgets and other routine financial records according to established procedures.

Common job titles: Accounting Clerk; Accounts Payable Clerk; Accounts Receivable Clerk; Audit Clerk; Billing Clerk; Budget Clerk; Costing Clerk; Deposit Clerk; Finance Clerk; Freight-Rate Clerk; Invoice Clerk; Ledger Clerk; Tax Clerk; Tax Return Preparer.

Typical employers: accounting and bookkeeping firms; banks and other financial institutions; federal, provincial and municipal governments; insurance companies; general merchandise stores.

Selected Main Duties

Accounting and related clerks perform some or all of the following duties:

- Calculate, prepare and issue bills, invoices, account statements and other financial statements according to established procedures, using manual and computerized systems;
- Process, verify and balance financial records and business transactions, such as accounts payable and receivable, and enter data into ledger or computerized system;
- Compile budget data and documents based on estimated revenues and expenses and previous budgets;
- Calculate costs of materials, overhead and other expenses based on estimates, quotations and price lists;
- Perform related clerical duties, such as maintaining filing and record systems, completing reports and answering client inquiries.

Working environment: Working in a computerized environment, accounting clerks may experience some additional seasonal demand preceding the tax season and overtime during month end weeks.

Education/Training

Completion of college or other courses in accounting, bookkeeping or computer application may be required. Knowledge of one or more computerized accounting software is necessary.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through the year 2005. A majority of job openings each year will stem from replacement needs as older workers retire.

A growing economy should result in more financial transactions and other activities and, therefore, more demand for accounting services. However, the improvements in computer-based technology to process financial and other types of information are moderating the demand for these clerks.

Virtually all accounting clerks now work in a computerized environment. Use of computerized accounting, inventory and billing systems are part of the job. Good computer skills will be essential.

Characteristics of Occupation

Estimated Employment in 2000: 40,900

	(%)
Male	19
Female	81
Full-time	82
Part-time	18
Self-employed	5
Employees	95
Working away from home	91
Working at home	8
No fixed workplace address	1

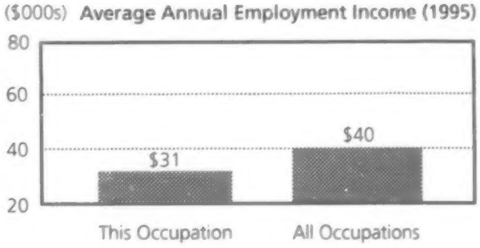
Employment by Region

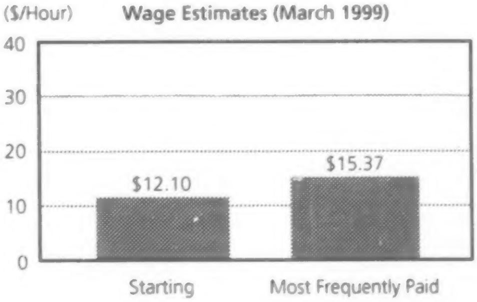
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	10	11
Toronto	51	42
London	5	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	2	3
Northeast	4	5
Northwest	2	2

Main Industries of Employment

	(%)
Business service	17
Manufacturing	16
Wholesale trade	11
Retail trade	11
Finance and insurance	8

Income and Wages





For more information

Certified General Accountants Association of Canada (www.cga-canada.org)

1433 Tellers, Financial Services

Description

Tellers in this unit group process customers' financial transactions and provide information on related banking products and services.

Common job titles: Bank Teller; Customer Service Representative, Financial Services; Foreign Exchange Teller; Senior Teller; Teller Trainee.

Typical employers: banks and other financial institutions.

Selected Main Duties

Tellers perform some or all of the following duties:

- Process customer cash deposits and withdrawals, cheques, transfers, bills, credit card payments, money orders, certified cheques and other related banking transactions;
- Obtain and process information required for the provision of services, such as opening accounts and savings plans and purchasing bonds;
- Sell travellers' cheques, foreign currency and money orders;
- Balance daily transactions using computer programs, calculators and adding machines;
- Sort and file deposit slips and cheques;
- Prepare customer statements and other correspondence for mailing;
- Answer inquiries and resolve problems.

Working environment: The work environment involves constant use of computer equipment and interaction with customers.

Education/Training

Increasing number of new hires by Canada's major banks require post-secondary schooling. Additional on-the-job training is usually provided.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to decline through the year 2005, with most job openings occurring as older workers retire. Increased computerization has vastly decreased the labour required to provide service to customers and to update their records. The clerical and accounting tasks of manual record keeping have disappeared from the branches of financial institutions all across the country.

The emergence of customer-based banking will lead tellers to switch their focus to selling services and offering financial counselling and advice. This will lead to a greater emphasis on problem solving and continuous learning.

While the position of teller remains a port of entry to the banking industry, increasingly, post-secondary school graduates are being hired to carry out the more complex product sales and customer relations functions expected of front-line banking staff.

Characteristics of Occupation

Estimated Employment in 2000: 26,500

	(%)
Male	14
Female	86
Full-time	62
Part-time	38
Self-employed	0
Employees	100
Working away from home	98
Working at home	0
No fixed workplace address	2

Employment by Region

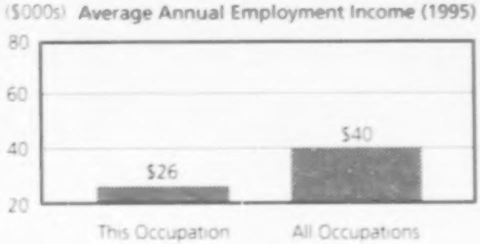
	(%) This Occupation	*(%) All Occupations*
Ottawa	8	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	12	11
Toronto	47	42
London	5	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	3	3
Northeast	5	5
Northwest	2	2

Main Industries of Employment

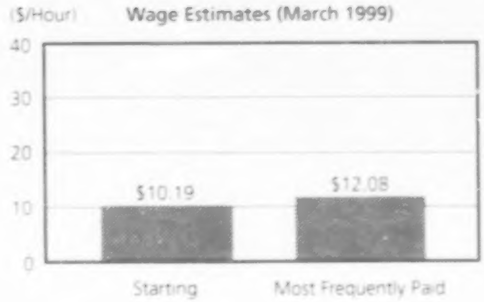
	(%)
Banks, trust and mortgage companies, credit unions	95

Income and Wages

Average Annual Employment Income (1995)



Wage Estimates (March 1999)



For more information

Institute of Canadian Bankers (www.icb.org)

1441 Administrative Clerks

Description

Administrative clerks compile, verify, record and process forms and documents, such as applications, licenses, permits, contracts, registrations and requisitions, in accordance with established procedures, guidelines and schedules.

Common job titles: Administrative Clerk; Applications Clerk; Authorization Clerk; By-law Clerk; Contract Clerk; Customs Clerk; Documentation Clerk; Import Clerk; License Clerk; Office Administration Clerk; Passport Clerk; Registration Clerk; Registry Clerk; Ward Clerk; Warranty Clerk.

Typical employers: hospitals; universities; insurance companies; banks and other financial institutions; elementary and secondary schools; colleges and other related schools; federal, provincial and municipal governments.

Selected Main Duties

Administrative clerks perform some or all of the following duties:

- Compile, verify, record and process applications, licenses, permits, contracts, registrations, requisitions and other forms and documents in accordance with established procedures and schedules, using manual and computerized processing systems;
- Authorize and issue licenses, permits, registration papers, reimbursements or other material after requesting documents have been processed and approved;
- Maintain inventory of office supplies and order supplies as required;
- Prepare routine reports and provide information to staff and general public regarding company and program rules, regulations and procedures;
- Assist in the co-ordination of administrative procedures such as budget submissions, contracts administration and work schedules;
- Organize and co-ordinate flow of work for general office clerks, clerk-typists and word processor operators.

Working environment: In smaller offices, the nature of the work is varied, while in larger offices, it tends to be more specialized and repetitive. Most of the work is done at a desk or a counter.

Education/Training

Completion of college or other courses in business administration is usually required. Ability to type or operate a computer may be required as most administrative transactions now involve computer entries. Some clerical experience may also be required.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to increase more slowly than the average for all occupations through the year 2005. Job openings will largely be created from the need to replace workers who retire.

While the routine administrative functions are increasingly computerized and more client self-service and self-registration systems are in use, there will be a greater focus on customer interaction, customer service and communication skills. Up-to-date computer skills will be important.

Characteristics of Occupation

Estimated Employment in 2000: 21,000

	(%)
Male	16
Female	84
Full-time	84
Part-time	16
Self-employed	2
Employees	98
Working away from home	95
Working at home	4
No fixed workplace address	1

Employment by Region

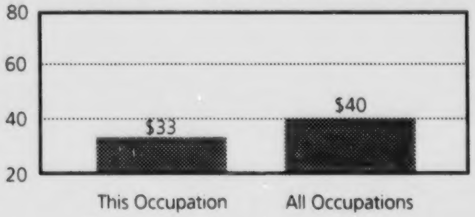
	(%) This Occupation	*(%) All Occupations*
Ottawa	18	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	8	11
Toronto	50	42
London	4	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	1	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

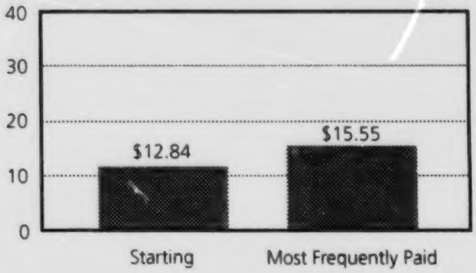
	(%)
Government service	22
Health and social service	12
Business service	11
Manufacturing	9
Finance and insurance	9

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Association of Administrative Assistants (www.aaa.ca)

1453 Customer Service, Information and Related Clerks

Description

This occupational group includes clerks who answer enquiries and provide information regarding an establishment's goods, services and policies, as well as, provide customer services such as receiving payments and processing requests for services.

Common job titles: Account Information Clerk; Complaint Clerk; Counter Enquiries Clerk; Courtesy Desk Clerk; Customer Service Clerk; Enquiries Clerk; Hospital Information Clerk; Information Clerk; Lost-and-Found Clerk; Public Relations Clerk; Tourist Information Clerk.

Typical employers: telecommunication companies; general merchandise stores; federal and provincial governments; insurance companies; electric power companies; computer service firms; postal and courier service companies.

Selected Main Duties

The following is a summary of the main duties for some occupations in this group:

- *Customer service clerks in retail establishments* answer enquiries from customers and investigate complaints regarding the establishment's goods, services and policies; arrange for refunds, exchange and credit for returned merchandise; receive account payments; and receive credit and employment applications;
- *Customer service clerks in insurance, telephone, utility and similar companies* explain the type and cost of services offered; obtain and process information required for the provision of services; arrange for billing; and receive payment for services;
- *Information clerks* provide information to customers and the public concerning goods, services, schedules, rates, regulations and policies in response to telephone and in-person enquiries.

Working environment: Customer service representatives, information and related clerks generally work in reception areas, though in small businesses and in some accommodation establishments they may be located at the front of the general office. Much of their work now occurs by telephone. Telemessages and automated call distribution technology which monitors performance targets (length of calls, need for referrals, time off-line) has increased the stress levels of many of these jobs.

Education/Training

Completion of secondary school is usually required. Clerical or sales experience may also be required. Most positions in this category require communication and computer skills along with product knowledge.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. The trend towards centralization of corporate information functions through telecentres, often located in lower-cost areas of the country, may negatively affect employment opportunities for this occupational group in large urban centres.

More highly automated phone systems will allow customers to deal directly with departments and to adjust their orders on line. In addition, transactions with suppliers will become more automated, leading to a more efficient resolution of customer problems. Customer service, information and related clerks may need to update their computer skills to respond to these changes.

This is an entry-level occupational group with hiring usually occurring directly out of high school.

Characteristics of Occupation

Estimated Employment in 2000: 23,200

	(%)
Male	30
Female	70
Full-time	72
Part-time	28
Self-employed	1
Employees	99
Working away from home	97
Working at home	1
No fixed workplace address	2

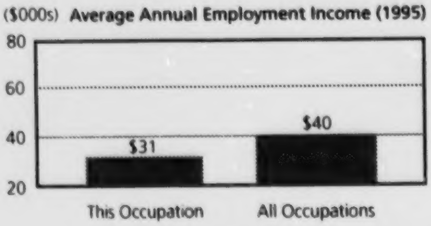
Employment by Region

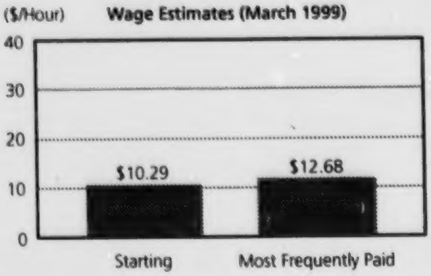
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	9	11
Toronto	55	42
London	5	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	1	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

	(%)
Retail trade	25
Communication and other utilities	14
Manufacturing	12
Wholesale trade	11
Government service	7

Income and Wages





For more information

Office Workers Career Centre (www.clericalworkerscentre.org)

1471 Shippers and Receivers

Description

Shippers and receivers ship, receive and record the movement of parts, supplies, materials, equipment and stock to and from an establishment.

Common job titles: Freight Receiver; Freight Shipper; Import-Freight Clerk; Receiver; Shipper; Shipper/Receiver; Shipping Agent; Shipping and Receiving Clerk.

Typical employers: general merchandise stores; motor vehicle parts manufacturers; food wholesalers; food stores.

Selected Main Duties

Shippers and receivers perform some or all of the following duties:

- Determine method of shipment and prepare bills of lading, invoices and other shipping documents;
- Assemble containers and crates, pack goods to be shipped and affix identifying information and shipping instructions;
- Oversee loading and unloading of goods from trucks or other conveyances;
- Inspect and verify incoming goods against invoices or other documents, record shortages and reject damaged goods;
- Unpack and route goods to appropriate storage areas;
- Maintain internal record-keeping systems;
- Operate forklift, hand truck or other equipment to load, unload, transport and store goods.

Working environment: Work is generally performed indoors and requires physical movement such as lifting, carrying and reaching. Receiving clerks perform the inverse of shipping clerks; they unpack, inspect and sort.

Education/Training

Employment in this area usually requires the completion of secondary school. Experience in a related clerical occupation or as a warehouse worker can improve employment prospects.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005 due to increasing manufacturing and trade activity. This occupation is very large, and a large number of job openings will occur each year to replace those who retire. Many jobs are entry-level and many vacancies will be created by normal career progression.

Increased automation and computerization – e.g., automated warehousing, bar-coding, "just-in-time" inventory systems – may mean that more shippers and receivers will require computer skills.

Characteristics of Occupation

Estimated Employment in 2000: 63,500

	(%)
Male	80
Female	20
Full-time	86
Part-time	14
Self-employed	1
Employees	99
Working away from home	98
Working at home	1
No fixed workplace address	1

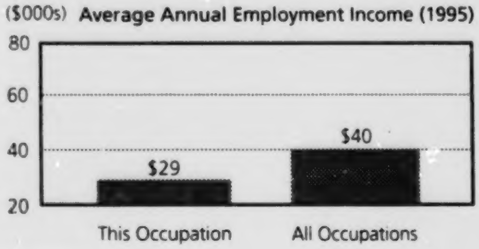
Employment by Region

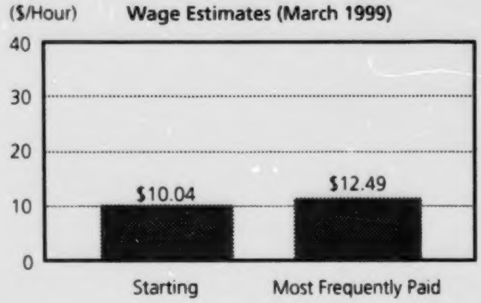
	(%) This Occupation	(%) All Occupations
Ottawa	7	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	11	11
Toronto	54	42
London	5	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	2	3
Northeast	2	5
Northwest	1	2

Main Industries of Employment

	(%)
Manufacturing	40
Wholesale trade	26
Retail trade	16
Transportation and storage	6

Income and Wages





For more information

Canadian International Freight Forwarders Association (www.ciffa.com)

1473 Production Clerks

Description

Production clerks co-ordinate and expedite the flow of work and materials within an establishment, prepare work and production schedules and monitor the progress of production and construction projects.

Common job titles: Expediter; Material Estimator; Production Clerk; Production Co-ordinator; Production Scheduler; Scheduling Clerk; Traffic Control Clerk.

Typical employers: primary steel producers; motor vehicle parts manufacturers; aircraft and parts manufacturers; motor vehicle manufacturers; machinery and equipment manufacturers; commercial printing firms.

Selected Main Duties

Production clerks perform some or all of the following duties:

- Compile detailed worksheets and specifications from customer's order;
- Estimate type and quantity of materials and labour required for production, construction and other projects;
- Consult with production supervisor to schedule production runs in a cost and time-efficient manner;
- Meet regularly with other production clerks, warehouse, production and construction supervisors and purchasing and inventory clerks to co-ordinate activities between warehouses and production floors or construction sites;
- Co-ordinate and monitor the movement of parts, supplies and materials within an establishment and ensure that supplies, materials and products are shipped and received on schedule;
- Prepare and maintain various reports on the progress of work, materials used, rates of production and other production information, using manual or computerized systems.

Working environment: Production clerks often work in a factory setting. A five-day workweek of 37 to 40 hours is normal. Shift work is not uncommon.

Education/Training

Completion of secondary school is usually required. Development of job-related skills through on-the-job training and taking job-related courses is important.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through the year 2005. Technological change is affecting this occupation. Computerized inventory systems, automated scheduling, statistical process control (SPC) systems and other innovations continue to affect the work of production clerks.

Since about two-thirds of production clerks work in the manufacturing and wholesale trade sectors, economic conditions have a strong impact on employment opportunities.

Characteristics of Occupation

Estimated Employment in 2000: 7,700

	(%)
Male	55
Female	45
Full-time	94
Part-time	6
Self-employed	2
Employees	98
Working away from home	97
Working at home	1
No fixed workplace address	2

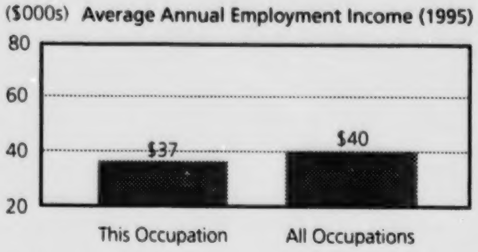
Employment by Region

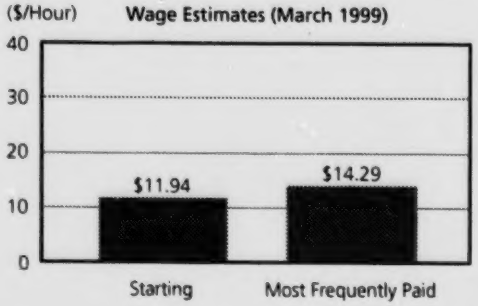
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	15	11
Toronto	43	42
London	5	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	3	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

	(%)
Manufacturing	60
Wholesale trade	9
Communication and other utilities	6
Business service	6

Income and Wages





For more information

APICS – The Educational Society for Resource Management (www.apics.org)

1474 Purchasing and Inventory Clerks

Description

Purchasing and inventory clerks process purchasing transactions and maintain inventories of materials, equipment and stock.

Common job titles: Inventory Clerk; Inventory Control Clerk; Procurement Clerk; Purchasing Assistant; Purchasing Clerk.

Typical employers: general merchandise stores; food stores; business services firms; hospitals; motor vehicle parts manufacturers; motor vehicle manufacturers; prescription drug stores.

Selected Main Duties

Purchasing clerks perform some or all of the following duties:

- Review requisition orders for accuracy and verify that materials, equipment and stock are not available from current inventories;
- Obtain price quotations from catalogues and suppliers and prepare purchase orders;
- Calculate cost of order and charge or forward invoice to appropriate account;
- Process purchases within purchasing authority;
- Contact suppliers to resolve shortages, missed deliveries and other problems;
- Prepare and maintain purchasing files, reports and price lists.

Inventory clerks perform some or all of the following duties:

- Monitor inventory levels as materials, equipment and stock are issued, transferred within an establishment or sold to the public;
- Compile inventory reports, recording the quantity, type and value of materials, equipment and stock on hand, using manual or computerized inventory systems;
- Prepare requisition orders to replenish materials, equipment and stock;
- Maintain stock rotation and dispose of and account for outdated stock;
- Reconcile calculated inventories with physical counts.

Working environment: Depending on the employer and the type of stock to be purchased or inventoried, clerks may have to work in cold, draughty warehouses and handle large, heavy items.

Education/Training

Completion of secondary school is usually required. Upgrading is possible on the job and through Purchasing Management Association of Canada certification.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to increase more slowly than the average for all occupations through 2005. Many job openings will be created each year from the need to replace workers who retire. Many jobs are entry-level and many vacancies will occur through normal career progression.

Employment growth for purchasing and inventory clerks has slowed because of the growing use of computers for inventory control and the installation of new, automated equipment. For example, computerized cash registers at retail outlets can automatically monitor inventories and prepare orders to replenish depleted stocks. Equivalent systems in manufacturing companies perform similar tasks. Electronic Data Interchange (EDI) systems permit order information to go directly to suppliers, largely eliminating the need for clerical inventory and order functions. To co-ordinate these on-line services, computer skills will need continuous upgrading.

Characteristics of Occupation

Estimated Employment in 2000: 11,400

	(%)
Male	51
Female	49
Full-time	84
Part-time	16
Self-employed	1
Employees	99
Working away from home	95
Working at home	1
No fixed workplace address	4

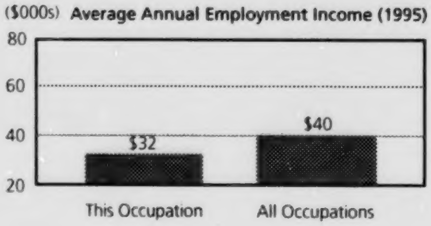
Employment by Region

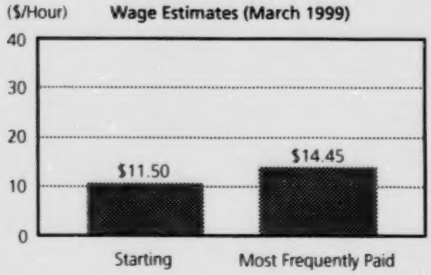
	(%) This Occupation	*(%) All Occupations*
Ottawa	7	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	12	11
Toronto	51	42
London	5	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	1	3
Northeast	4	5
Northwest	1	2

Main Industries of Employment

	(%)
Manufacturing	31
Wholesale trade	23
Retail trade	18
Business service	8

Income and Wages





For more information

Purchasing Management Association of Canada (www.pmac.ca)

2112 Chemists

Description

Chemists are involved in process control, industrial operations, product development, quality control, environmental control, medical diagnosis and treatment, biotechnology and other applications. They also conduct theoretical, experimental and applied research into basic chemical and biochemical processes to create or synthesize new products and processes.

Common job titles: Biochemist; Clinical Chemist; Food Chemist; Polymer Chemist.

Typical employers: federal and provincial governments; universities; pharmaceutical companies; architectural, engineering and other scientific companies; chemical products manufacturers; industrial chemicals manufacturers; hospitals; medical laboratories.

Selected Main Duties

Chemists perform some or all of the following duties:

- Analyse, synthesize, purify, modify and characterize chemical or biochemical compounds such as polymers, synthetic materials or foods as well as pharmaceuticals;
- Develop and conduct programs of analysis to ensure quality control of raw materials, chemical intermediates or final products;
- Conduct programs of sample and data collection and analysis to identify and quantify environmental toxicants;
- Conduct research to develop new chemical formulations and processes and devise new technical applications of industrial chemicals and compounds;
- Conduct fundamental and applied research into the synthesis and properties of chemical compounds and the mechanisms of chemical reactions;
- Investigate chemical aspects of the mechanism of drug action, the diagnosis and treatment of disease, organ function and the assessment of health;
- Participate in interdisciplinary research and development projects working with chemical engineers, biologists, microbiologists, agronomists, geologists or other professionals;
- Act as technical consultant in a particular field of expertise;
- Supervise other chemists and chemical technicians and technologists.

Working environment: Chemists work regular hours in research, developmental and quality control laboratories or offices. Exposure to dangerous chemicals is possible, but safety precautions substantially reduce any risk.

Education/Training

A bachelor's degree in chemistry, biochemistry or in a related discipline is required for clinical research assistants as well as non-research positions in sales or in secondary level teaching. A doctoral degree is usually required to conduct independent laboratory research, advance into administrative research positions or teach at the university level. A master's degree is necessary for jobs in applied research and testing.

With experience, mobility is possible between occupations within this group, as well as to occupations such as plant management, technical sales, and the development and management of regulatory programs and teaching professions.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. The employment of these professionals is closely related to investment in research and development. Chemists will require continued skills upgrading, as the pace of advance in knowledge is very rapid in this field, particularly in the biochemical field.

There is a tendency toward collaboration with specialists in other field, such as engineering. In addition to knowledge, employers look for computer, teamwork, communication, planning and organizing skills.

Characteristics of Occupation

Estimated Employment in 2000: 5,900

	(%)
Male	67
Female	33
Full-time	94
Part-time	6
Self-employed	3
Employees	97
Working away from home	97
Working at home	2
No fixed workplace address	1

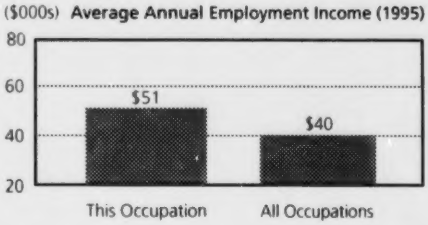
Employment by Region

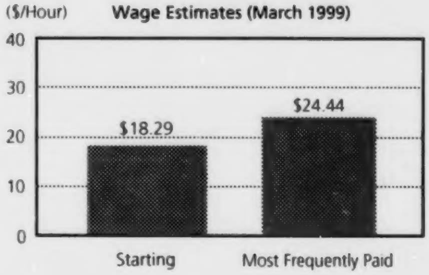
	(%) This Occupation	*(%) All Occupations*
Ottawa	17	10
Kingston-Pembroke	5	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	10	11
Toronto	51	42
London	4	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	0	3
Northeast	1	5
Northwest	1	2

Main Industries of Employment

	(%)
Chemical and chemical products	31
Business service	16
Government service	15
Educational service	10
Health and social service	9

Income and Wages





For more information

Association of the Chemical Profession of Ontario (www.acpo.on.ca)
Canadian Society for Chemical Engineering (www.chemeng.ca)
Canadian Society of Clinical Chemists (www.cscc.ca)
The Chemical Institute of Canada (www.chem-inst-can.org)

2113 Geologists, Geochemists and Geophysicists

Description

Geologists, geochemists and geophysicists conduct programs of exploration and research to extend knowledge of the structure, composition and processes of the earth, to locate and identify hydrocarbon, mineral and groundwater resources, to plan and implement programs of hydrocarbon and mineral extraction and to assess and mitigate the effects of development and waste disposal projects on the environment.

Common job titles: Environmental Geologist; Geophysicist; Hydrologist; Mineralogist; Oceanographer.

Typical employers: engineering and other scientific companies; mining companies; federal and provincial governments; service firms to mining companies; universities; non-ferrous metal smelting and refining companies.

Selected Main Duties

Geologists, geochemists and geophysicists perform some or all of the following duties:

- Conduct theoretical and applied research to extend knowledge of surface and subsurface features of the earth, its history and the operation of physical, chemical and biological systems that control its evolution;
- Plan, direct and participate in field studies, testing programs, sensing programs and analysis of geological, geochemical and geophysical survey data;
- Develop applied software for the analysis and interpretation of data;
- Assess the size, orientation and composition of mineral ore bodies and hydrocarbon deposits;
- Identify deposits of construction materials and determine their characteristics and suitability for use as concrete aggregates, road fill or for other applications;
- Assess the movement of ground and surface waters and advise in areas such as waste management, route and site selection and the restoration of contaminated sites;
- Recommend the acquisition of lands, exploration and mapping programs and mine development;
- Conduct geological and geophysical studies for regional development, site selection and the development of public works projects;
- Identify and anticipate natural risks such as slope erosion, landslides, soil instability, subsidence, earthquakes and volcanic eruptions;
- Supervise and co-ordinate well drilling, completion and work-overs and mining activities.

Working environment: Some geologists spend most of their time in an office. Others divide their time between fieldwork and office or a laboratory. Treks to remote areas are not unusual, and job relocation is not uncommon.

Education/Training

A university degree in geology, geochemistry, geophysics or a related discipline is required. Those conducting research or teaching in a post-secondary establishment usually require a master's or doctoral degree. Professional designation may also be required for employment. With experience, mobility between specilizations in this group is possible. Advancement is possible to management positions in mining, petroleum or other industries.

Employment Prospects

Over the next five years: Limited

Employment for this occupation is expected to increase more slowly than the average for all occupations through the year 2005.

This occupational group is particularly sensitive to changes in mineral exploration and mining activity. Environmental concerns may increase the demand for engineering and environmental geologists able to evaluate hazards and recommend solutions to pollution problems.

Characteristics of Occupation

Estimated Employment in 2000: 2,600

	(%)
Male	82
Female	18
Full-time	91
Part-time	9
Self-employed	9
Employees	91
Working away from home	87
Working at home	8
No fixed workplace address	5

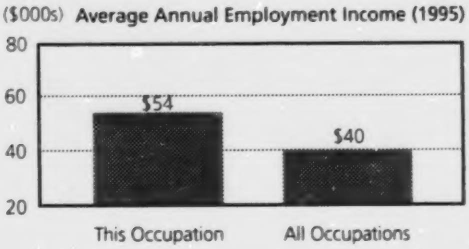
Employment by Region

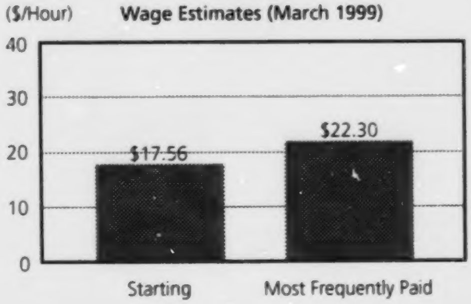
	(%) This Occupation	*(%) All Occupations*
Ottawa	25	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	3	11
Toronto	26	42
London	4	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	1	3
Northeast	22	5
Northwest	4	2

Main Industries of Employment

	(%)
Business service	46
Mining	22
Government service	19

Income and Wages





For more information

Canadian Society of Exploration Geophysicists (www.cseg.org)
Canadian Meteorological and Oceanographic Society (www.meds-sdmm.dfo-mpo.gc.ca/cmos)
Earth and Ocean Sciences (The University of British Columbia) (www.eos.ubc.ca)

2121 Biologists and Related Scientists

Description

Biologists and related scientists conduct basic and applied research to extend knowledge of living organisms, to manage natural resources, and to develop new practices and products related to medicine and agriculture.

Common job titles: Bacteriologist; Ecologist; Geneticist; Immunologist; Toxicologist.

Typical employers: federal and provincial governments; universities; hospitals; architectural, engineering and other scientific companies; medical laboratories; pharmaceutical companies; service firms to agriculture.

Selected Main Duties

Biologists perform some or all of the following duties:

- Plan and conduct studies of the environment and the population, distribution, structure and functional characteristics and behaviour of plants and animals;
- Conduct ecological and environmental impact studies and prepare reports;
- Study, identify and classify plant and animal specimens;
- Conduct experiments in plant or animal growth, heredity and breeding;
- Prepare reports and plans for management of renewable resources;
- Supervise biological technologists and technicians and other scientists.

Microbiologists and *cell and molecular biologists* perform some or all of the following duties:

- Conduct research into the structure, function, ecology, biotechnology and genetics of micro-organisms, including bacteria, fungi, protozoans and algae;
- Conduct research into the structure and functioning of human, animal and plant tissues and cells;
- Conduct studies into the identification, effects and control of human, plant and animal pathogens and toxins;
- Conduct clinical or laboratory studies to test, evaluate and screen drugs and pharmaceuticals;
- Conduct molecular or biochemical studies and experiments into genetic expression, gene manipulation and recombinant DNA technology;
- Supervise biological technologists and technicians and other scientists.

Working environment: Biologists and related scientists generally work regular hours in offices and laboratories. Some spend time outdoors conducting research on biological samples. Work with dangerous organisms or toxic substances in the laboratory pose some potential dangers.

Education/Training

A bachelor's degree in biology or in a related discipline is required for biologists. A master's or doctorate degree in biology or a related discipline is required for employment as a research scientist in biology. Postdoctoral research experience is usually required before employment in academic departments or research institutions. Biologists and related scientists may specialize at the macroscopic level in fields such as botany, zoology, ecology, and marine biology, or at the cellular and molecular level in fields such as genetics, immunology, pharmacology, toxicology, physiology, pathology, bacteriology and virology.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow more rapidly than the average for all occupations through the year 2005. The public sector is the largest employer of biologists. Typically, demand for biologists is related to environmental research and monitoring. However, growth in biotechnology is expected to improve employment prospects. There is also a shift toward interdisciplinary programs, combining systems engineering with microbiology and other scientific specialties.

Computer-based competencies such as bioinformatics and molecular modelling are also becoming more important as companies and researchers deal with the integration of traditional and information sciences.

Characteristics of Occupation

Estimated Employment in 2000: 3,100

	(%)
Male	62
Female	38
Full-time	93
Part-time	7
Self-employed	6
Employees	94
Working away from home	93
Working at home	5
No fixed workplace address	2

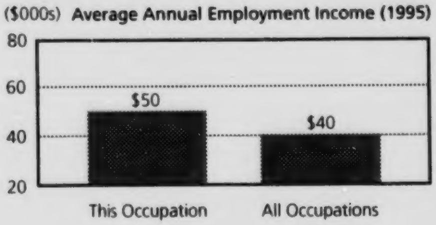
Employment by Region

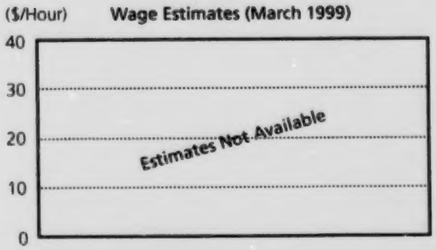
	(%) This Occupation	*(%) All Occupations*
Ottawa	26	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	7	11
Toronto	38	42
London	4	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	1	3
Northeast	6	5
Northwest	2	2

Main Industries of Employment

	(%)
Government service	32
Business service	17
Health and social service	16
Educational service	15
Chemical and chemical products manufacturing	7

Income and Wages





For more information

Canadian College of Microbiologists (www.ccm.ca)
Canadian Society of Environmental Biologists (www.freenet.edmonton.ab.ca/cseb/english.html)
BIOTECanada (www.biotech.ca)

2131 Civil Engineers

Description

Civil engineers plan, design, develop and manage projects for the construction or repair of various structures such as buildings, roads, airports, railways, rapid transit facilities, bridges, dams, ports and coastal installations and systems related to highway and transportation services, water distribution and sanitation. Civil engineers may also specialize in foundation analysis, building and structural inspection, surveying and municipal planning.

Common job titles: Environmental Engineer; Construction Engineer; Structural Engineer; Transportation Engineer.

Typical employers: architectural, engineering and other scientific companies; federal, provincial and municipal governments; electric power companies; residential building developers; highway and heavy construction firms.

Selected Main Duties

Civil engineers perform some or all of the following duties:

- Confer with clients and other members of the engineering team and conduct research to determine project requirements;
- Plan and design major civil projects such as buildings, roads, bridges, dams, water and waste management systems and structural steel fabrications;
- Develop construction specifications and procedures;
- Evaluate and recommend appropriate building and construction materials;
- Interpret, review and approve survey and civil design work;
- Conduct field services for civil works;
- Ensure construction plans meet guidelines and specifications of building codes and other regulations;
- Establish and monitor construction work schedules;
- Conduct feasibility studies, economic analyses, municipal and regional traffic studies, environmental impact studies or other investigations;
- Conduct technical analyses of survey and field data for development of topographic, soil, hydrological or other information and prepare reports;
- Act as project or site supervisor for land survey or construction work;
- Prepare contract documents and review and evaluate tenders for construction projects;
- Supervise technicians, technologists and other engineers and review and approve designs, calculations and cost estimates.

Working environment: A 35 to 40-hour workweek is normal for civil engineers. However, civil engineers are often away from their desks and at the work site. Prolonged hours may be necessary to complete major projects or deal with unexpected emergencies.

Education/Training

A bachelor's degree in civil engineering or an appropriate related engineering discipline is required. Registration as a Professional Engineer (P.Eng.) by a provincial or territorial association of professional engineers is often required for employment and to practice as a civil engineer. Candidates for license must have completed an engineering program accredited by Professional Engineers Ontario or demonstrate equivalent educational qualifications, as well as have 48 months of satisfactory work experience.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through the year 2005. Most job openings will result from the need to replace workers who retire.

Employment of civil engineers is cyclical and is closely tied to construction activity. Globalization of civil engineering services may result in employment opportunities outside of Canada.

Characteristics of Occupation

Estimated Employment in 2000: 12,300

	(%)
Male	93
Female	7
Full-time	95
Part-time	5
Self-employed	6
Employees	94
Working away from home	88
Working at home	7
No fixed workplace address	5

Employment by Region

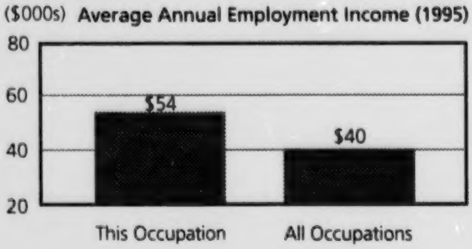
	(%) This Occupation	*(%) All Occupations*
Ottawa	14	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	11	11
Toronto	47	42
London	5	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	1	3
Northeast	4	5
Northwest	2	2

Main Industries of Employment

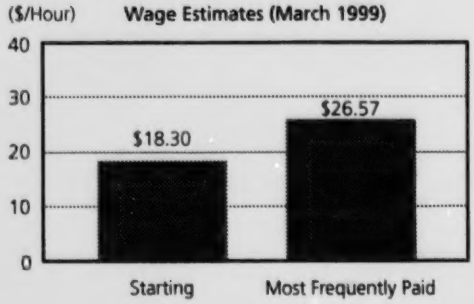
	(%)
Business service	44
Government service	20
Construction	11
Manufacturing	8
Communication and other utilities	6

Income and Wages

Average Annual Employment Income (1995)



Wage Estimates (March 1999)



For more information

Professional Engineers Ontario (www.peo.on.ca)
Association of Consulting Engineers of Canada (www.acec.ca)
Canadian Council of Professional Engineers (www.ccpe.ca)
Ontario Municipal Engineers Association (www.municipalengineers.on.ca)

2132 Mechanical Engineers

Description

Mechanical engineers research, design and develop machinery and systems for heating, ventilating and air-conditioning, power generation, transportation, processing and manufacturing. They also perform duties related to the evaluation, installation, operation and maintenance of mechanical systems that produce, transmit or consume power or employ heat energy in everything from aircraft engines to heating, ventilation and air conditioning systems.

Common job titles: Mechanical Design Engineer; Heating Engineer; Refrigeration Engineer; Automotive Engineer.

Typical employers: architectural, engineering and other scientific companies; electric power companies; motor vehicle parts manufacturers; motor vehicle manufacturers; machinery and equipment manufacturers; aircraft and parts manufacturers.

Selected Main Duties

Mechanical engineers perform some or all of the following duties:

- Conduct research into the feasibility, design, operation and performance of mechanisms, components and systems;
- Prepare material, cost and timing estimates, reports and design specifications for machinery and systems;
- Design power plants, machines, components, tools, fixtures and equipment;
- Supervise and inspect the installation, modification and commissioning of mechanical systems at construction sites or in industrial facilities;
- Develop maintenance standards, schedules and programs and provide guidance to industrial maintenance crews;
- Investigate mechanical failures or unexpected maintenance problems;
- Prepare contract specifications and cost estimates and evaluate tenders for industrial construction or maintenance;
- Supervise technicians, technologists and other engineers and review and approve designs, calculations and cost estimates.

Working environment: Mechanical engineers work indoors, both in the office and on the plant floor, close to machinery and equipment.

Education/Training

A bachelor's degree in mechanical engineering or an appropriate related engineering discipline is required. Registration as a Professional Engineer (P.Eng.) by a provincial or territorial association of professional engineers is often required for employment and to practice as a mechanical engineer. Candidates for license must have completed an engineering program accredited by Professional Engineers Ontario or demonstrate equivalent educational qualifications, as well as have 48 months of satisfactory work experience.

Employment Prospects

Over the next five years: Strong

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005.

Job seekers with the appropriate skills and qualifications can expect good employment opportunities, as employers across Ontario report difficulties in finding qualified workers to fill vacant positions. Many employers have been recruiting outside of Canada. Employment of mechanical engineers is concentrated in manufacturing, and as such moves in tangent with the general level of economic activity of the sector.

The growing use of electronics in machinery and process control will lead to an increased overlap between mechanical and electrical and electronics engineering. Many mechanical engineers will need skills in this area. The increased emphasis on quality control in production will require individuals with up-to-date skills and with knowledge of quality control processes to meet international quality standards. Employers seek individuals with general and specific computer skills, as well as, communication and teamwork skills.

Characteristics of Occupation

Estimated Employment in 2000: 17,700

	(%)
Male	94
Female	6
Full-time	96
Part-time	4
Self-employed	6
Employees	94
Working away from home	93
Working at home	5
No fixed workplace address	2

Employment by Region

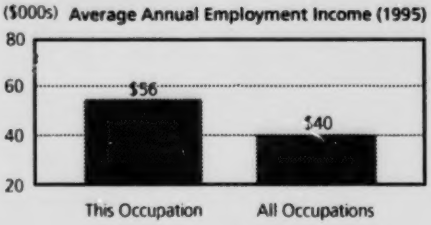
	(%) This Occupation	*(%) All Occupations*
Ottawa	8	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	11	11
Toronto	43	42
London	5	5
Windsor-Sarnia	10	5
Stratford-Bruce Peninsula	3	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

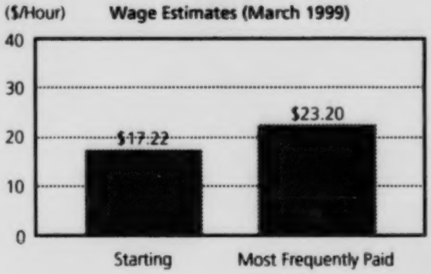
	(%)
Manufacturing	50
Business service	27

Income and Wages

Average Annual Employment Income (1995)



Wage Estimates (March 1999)



For more information

Professional Engineers Ontario (www.peo.on.ca)
Association of Consulting Engineers of Canada (www.acec.ca)
Canadian Council of Professional Engineers (www.ccpe.ca)
Society of Automotive Engineers (www.sae.org)

2133 Electrical and Electronics Engineers

Description

Electrical and electronics engineers design, plan, research and evaluate electrical and electronic equipment and systems. They direct or supervise installations, testing, inspection and maintenance activities, and may specialize in many areas such as electrical power generation and transmission, communication systems, instrumentation and control systems, computer applications and software design.

Common job titles: Avionics Engineer; Communications Engineer; Instrumentation and Control Engineer; Electrical Engineer; Electronics Test Engineer.

Typical employers: engineering and other scientific companies; electric power companies; telecommunication companies; electronic equipment manufacturers; business machine manufacturers; electrical equipment manufacturers; computer service firms.

Selected Main Duties

Electrical and electronics engineers perform some or all of the following duties:

- Conduct research into the feasibility, design, operation and performance of electrical generation and distribution networks, electrical machinery and components and electronic communications, instrumentation and control systems, equipment, and components;
- Prepare material cost and timing estimates, reports and design specifications for electrical and electronic systems and equipment;
- Design electrical and electronic circuits, components, systems and equipment;
- Supervise and inspect the installation, modification, testing and operation of electrical and electronic systems and equipment;
- Develop maintenance and operating standards for electrical and electronic systems and equipment;
- Investigate electrical or electronic failures;
- Develop specialized applications and system software;
- Prepare contract documents and evaluate tenders for construction or maintenance;
- Supervise technicians, technologists, programmers, analysts and other engineers.

Working environment: The work setting may be both indoors and outdoors. Although the physical demands of the work are light, electrical engineers may be exposed to hazards and, therefore, must be aware of safety measures.

Education/Training

A bachelor's degree in electrical or electronics engineering or in an appropriate related engineering discipline is required. Registration as a Professional Engineer (P.Eng.) by a provincial or territorial association of professional engineers is often required for employment and to practice as an electrical or electronics engineer. Candidates for license must have completed an engineering program accredited by Professional Engineers Ontario or demonstrate equivalent educational qualifications, as well as have 48 months of satisfactory work experience.

Specialization in electronics engineering fields may occur either in educational programs or in the workplace. Electrical and electronics engineers may specialize in a number of areas such as electrical design for residential, commercial or industrial installations, electrical power generation and transmission, communications systems and instrumentation and control systems. There is considerable mobility among electrical and electronics engineering specializations at the less senior levels. Engineers often work in a multidisciplinary environment and acquire knowledge and skills through work experience that may allow them to practice in associated areas of science, engineering, sales, marketing or management.

Employment Prospects

Over the next five years: Strong

Employment for this occupation is expected to increase as fast as the average for all occupations through the year 2005. However, many job openings will be created each year from the need to replace workers who retire. Job seekers with the appropriate skills and qualifications should have good opportunities of finding employment, as employers across Ontario report difficulties in finding qualified workers to fill vacant positions. Many employers have been recruiting outside Canada for workers.

Engineers will have to continually upgrade their skills in order to keep up with the rapid changes in technology. Firms face intense international competition requiring their engineers to be at the leading edge of their field.

There are likely to be significant new opportunities for these engineers in setting up computerized production systems. This may require electrical and electronic engineers to work more closely with mechanical engineers.

Characteristics of Occupation

Estimated Employment in 2000: 15,000

	(%)
Male	91
Female	9
Full-time	97
Part-time	3
Self-employed	4
Employees	96
Working away from home	93
Working at home	5
No fixed workplace address	2

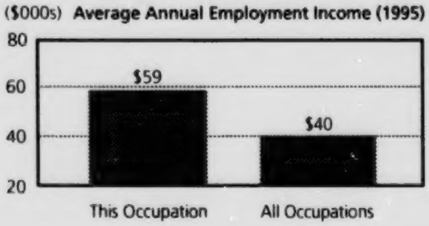
Employment by Region

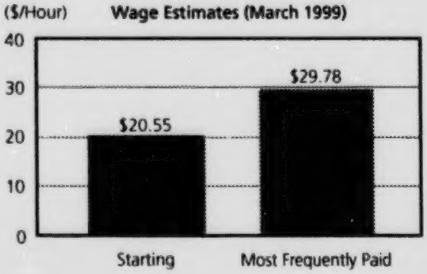
	(%) This Occupation	*(%) All Occupations*
Ottawa	29	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	7	11
Toronto	45	42
London	3	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	1	3
Northeast	2	5
Northwest	1	2

Main Industries of Employment

	(%)
Electrical and electronic products manufacturing	27
Business service	24
Communication and other utilities	18

Income and Wages





For more information

Professional Engineers Ontario (www.peo.on.ca)
Association of Consulting Engineers of Canada (www.acec.ca)
Canadian Council of Professional Engineers (www.ccpe.ca)

2134 Chemical Engineers

Description

Chemical engineers research, design and develop chemical processes and equipment, oversee the operation and maintenance of industrial, chemical, plastics, pharmaceutical, resource, pulp and food processing plants and perform duties related to chemical quality control, environmental protection and biochemical or biotechnical engineering.

Common job titles: Biochemical Engineer; Chemical Process Engineer; Petrochemical Engineer; Refinery Engineer.

Typical employers: architectural, engineering and other scientific companies; industrial chemicals manufacturers; chemical products manufacturers; electric power companies; plastic and synthetic resin manufacturers; pharmaceutical companies; refined petroleum products manufacturers; federal government; pulp and paper companies.

Selected Main Duties:

Chemical engineers perform some or all of the following duties:

- Conduct economic and technical feasibility studies in areas related to chemical, petroleum, pulp and paper, food or other processing industries;
- Conduct research into the development or improvement of chemical engineering processes, reactions and materials;
- Evaluate chemical process technology and equipment and determine production specifications;
- Design and test chemical processing and associated plants and equipment;
- Oversee the construction, modification, operation and maintenance of pilot plants, processing units or processing plants;
- Establish and conduct quality control programs, operating procedures and control strategies to ensure consistency and adherence to standards for raw materials, products and waste products or emissions;
- Prepare contract documents and evaluate tenders for the process aspects of industrial construction;
- Supervise technicians, technologists and other engineers;
- Work in an administrative capacity, for example, in the development of guidelines and specifications for the handling of dangerous chemicals, environmental protection or standards for foods, materials and consumer goods.

Working environment: Chemical engineers' work environments vary from indoor offices, where they work in design and with mathematical computations, to indoor and outdoor factories, where the chemical engineer may be surrounded with machinery, chemicals, materials and equipment. More junior engineers tend to spend more time in the field than their senior counterparts.

Education/Training

A bachelor's degree in chemical engineering or an appropriate related engineering discipline is required. Registration as a Professional Engineer (P.Eng.) by a provincial or territorial association of professional engineers is often required for employment and to practice as a chemical engineer. Candidates for license must have completed an engineering program accredited by Professional Engineers Ontario or demonstrate equivalent educational qualifications, as well as have 48 months of satisfactory work experience.

Employment Prospects

Over the next five years: Strong

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Job seekers with the appropriate skills and qualifications can expect good employment opportunities, as employers across Ontario report difficulties in finding qualified workers to fill vacant positions. About one half of all chemical engineers work in the manufacturing sector. Areas related to the production of specialty chemicals, pharmaceuticals and plastics materials provide most of the new job opportunities.

Employers are seeking increasingly cross-degree scientists. An example of this multidisciplinary path would be a person with chemistry, plus a divergent post-doctoral degree such as cell biology and computer skills.

Characteristics of Occupation

Estimated Employment in 2000: 2,700

	(%)
Male	87
Female	13
Full-time	96
Part-time	4
Self-employed	5
Employees	95
Working away from home	93
Working at home	6
No fixed workplace address	1

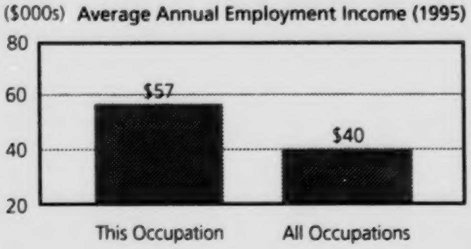
Employment by Region

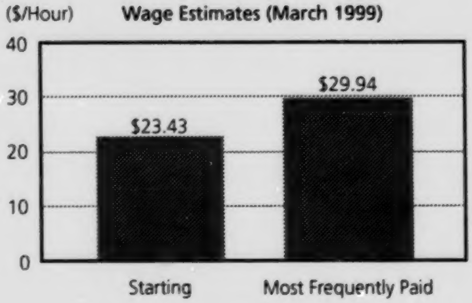
	(%) This Occupation	*(%) All Occupations*
Ottawa	8	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	11	11
Toronto	40	42
London	3	5
Windsor-Sarnia	16	5
Stratford-Bruce Peninsula	1	3
Northeast	5	5
Northwest	1	2

Main Industries of Employment

	(%)
All other manufacturing	33
Business service	25
Chemical and chemical products	23

Income and Wages


Average Annual Employment Income (1995)


Wage Estimates (March 1999)

For more information

Professional Engineers Ontario (www.peo.on.ca)
Association of Consulting Engineers of Canada (www.acec.ca)
Canadian Council of Professional Engineers (www.ccpe.ca)
Canadian Society for Chemical Engineering (www.chemeng.ca)

2141 Industrial and Manufacturing Engineers

Description

Industrial and manufacturing engineers conduct studies and develop and supervise programs to achieve efficient industrial production based on an efficient utilization of machinery, materials and human resources.

Common job titles: Cost Engineer; Methods Engineer; Plant Engineer; Production Engineer; Safety Engineer.

Typical employers: motor vehicle parts manufacturers; motor vehicle manufacturers; architectural, engineering and other scientific companies; machinery and equipment manufacturers; aircraft and parts manufacturers; electronic equipment manufacturers; primary steel producers; business machine manufacturers.

Selected Main Duties

Industrial and manufacturing engineers perform some or all of the following duties:

- Plan and design plant layouts and facilities;
- Study new machinery and facilities and recommend or select efficient combinations;
- Develop flexible or integrated manufacturing systems and procedures;
- Conduct studies and implement program to determine optimum inventory levels for production and to allow optimum utilization of resources;
- Analyse costs of production;
- Design, develop and conduct time studies and work simplification programs;
- Determine human resource and skill requirements and develop training programs;
- Develop performance standards, evaluation systems and wage and incentive programs;
- Conduct studies of the reliability and performance of plant facilities, and production or administrative systems;
- Establish programs and conduct studies to enhance industrial health and safety or to identify and correct fire and other hazards;
- Evaluate or assess industrial facilities;
- Supervise technicians, technologists, analysts, administrative staff and other engineers.

Working environment: Industrial engineers work mainly indoors, often on the plant floor. The usual workweek is five days or 37.5 to 40 hours long.

Education/Training

A bachelor's degree in industrial engineering or an appropriate related engineering discipline is required. Registration as a Professional Engineer (P.Eng.) by a provincial or territorial association of professional engineers is often required for employment and to practice as an industrial engineer. Candidates for license must have completed an engineering program accredited by Professional Engineers Ontario or demonstrate equivalent educational qualifications, as well as have 48 months of satisfactory work experience.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005 due to industrial growth and the greater use of automation in factories and in offices. In addition, many job openings will be created each year from the need to replace workers who retire.

About three-quarters of all industrial and manufacturing engineers work in the manufacturing sector. The increased emphasis on product quality will require engineers to have expertise in quality control to meet international quality standards.

Employers look for individuals skilled in computer based drafting, spreadsheet and database software applications as well as having communication, teamwork, planning and organizing, and problem solving skills.

Characteristics of Occupation

Estimated Employment in 2000: 7,900

	(%)
Male	90
Female	10
Full-time	95
Part-time	5
Self-employed	3
Employees	97
Working away from home	96
Working at home	3
No fixed workplace address	1

Employment by Region

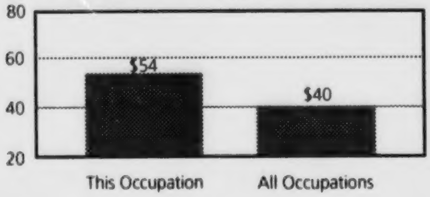
	(%) This Occupation	*(%) All Occupations*
Ottawa	6	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	13	9
Hamilton-Niagara Peninsula	14	11
Toronto	39	42
London	7	5
Windsor-Sarnia	11	5
Stratford-Bruce Peninsula	2	3
Northeast	2	5
Northwest	1	2

Main Industries of Employment

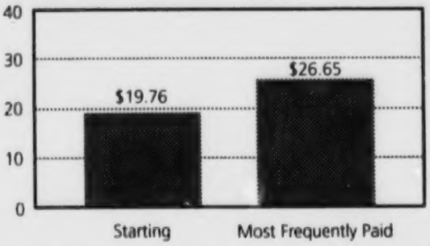
	(%)
All other manufacturing	40
Transportation equipment	28
Business service	11
Electrical and electronic products	10

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Professional Engineers Ontario (www.peo.on.ca)
Association of Consulting Engineers of Canada (www.acec.ca)
Canadian Council of Professional Engineers (www.ccpe.ca)
Society of Manufacturing Engineers (www.sme-toronto-26.org)

2146 Aerospace Engineers

Description

Aerospace engineers research, design and develop aircraft, spacecraft, missiles, aerospace systems and their components, and perform duties related to the testing, evaluation, installation, operation and maintenance of aerospace vehicles and systems.

Common job titles: Aerodynamics Engineer; Aeronautical Engineer; Aerospace Test Engineer.

Typical employers: aircraft and parts manufacturers; scientific and professional equipment manufacturers; architectural, engineering and other scientific companies; federal government; electronic equipment manufacturers; airline companies; repair services; defence services; machinery and equipment wholesalers.

Selected Main Duties

Aerospace engineers perform some or all of the following duties:

- Design and develop aerospace vehicles, systems and components;
- Develop and conduct computer simulations of aerospace vehicles, systems and components;
- Prepare specifications for materials and processes to be used in aerospace manufacturing, maintenance, repair or modification;
- Supervise and co-ordinate the manufacturing, assembly modification, repair and overhaul of aircraft and spacecraft;
- Co-ordinate ground and flight tests of air and spacecraft;
- Develop operational specifications, maintenance schedules and manuals for operators;
- Develop the technical phases of logistical and operational support for aerospace vehicles and systems;
- Investigate and report on structural or other component or system failures, accidents or incidents and prepare recommendations for corrective action.

Working environment: Most aerospace engineers work in laboratories or sometimes in industrial plants. Many work a standard 40-hour workweek.

Education/Training

A bachelor's degree in aerospace engineering or an appropriate related engineering discipline is required. Registration as a Professional Engineer (P.Eng.) by a provincial or territorial association of professional engineers is often required for employment and to practice as an aerospace engineer. Candidates for license must have completed an engineering program accredited by Professional Engineers Ontario or demonstrate equivalent educational qualifications, as well as have 48 months of satisfactory work experience.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Demand for aerospace engineers is highly dependent on world-wide demand for aircraft. Job prospects are considerably better for experienced engineers with highly developed computer skills.

The industry's traditional preferences for experienced workers (two to three years) may be changing as the nature of work in the industry changes and advanced computer and design skills of a kind that require recent formal training become more important.

Characteristics of Occupation

Estimated Employment in 2000: 4,700

	(%)
Male	91
Female	9
Full-time	98
Part-time	2
Self-employed	5
Employees	95
Working away from home	97
Working at home	2
No fixed workplace address	1

Employment by Region

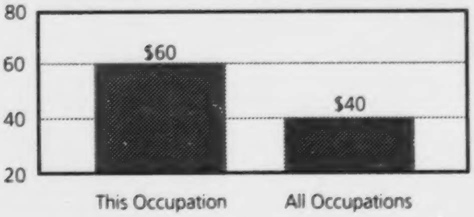
	(%) This Occupation	*(%) All Occupations*
Ottawa	21	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	0	3
Kitchener-Waterloo-Barrie	4	9
Hamilton-Niagara Peninsula	5	11
Toronto	67	42
London	1	5
Windsor-Sarnia	0	5
Stratford-Bruce Peninsula	1	3
Northeast	0	5
Northwest	0	2

Main Industries of Employment

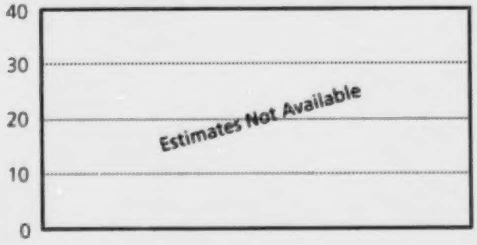
	(%)
Transportation equipment	49
Business service	20
Government service	10
Electrical and electronic products	5

Income and Wages

($000s) Average Annual Employment Income (1995)



($/Hour) Wage Estimates (March 1999)



For more information

Professional Engineers Ontario (www.peo.on.ca)
Association of Consulting Engineers of Canada (www.acec.ca)
Canadian Council of Professional Engineers (www.ccpe.ca)
Aerospace Industries Association of Canada (www.aiac.ca)

2147 Computer Engineers

Description

Computer engineers research, plan, design, develop and test computers and related equipment, and design and develop software for engineering and industrial applications. Computer hardware engineers are employed primarily by computer manufacturers. Software engineers are employed primarily by companies which manufacture and market software products. However, the term software engineer may be loosely substituted for programmer by some firms.

Common job titles: Computer Applications Engineer; Computer Software Engineer; Hardware Engineer; Systems Design Engineer.

Typical employers: computer service firms; architectural, engineering and other scientific companies; business machine manufacturers; electronic equipment manufacturers; telecommunication companies; electrical and electronic machinery and equipment wholesalers; federal government; banks and other financial institutions; electric power companies.

Selected Main Duties

Computer hardware engineers perform some or all of the following duties:

- Plan, design and co-ordinate the development of computers and related equipment;
- Supervise and inspect the installation, modification and testing of computers and related equipment;
- Supervise drafters, technicians, technologists and other engineers.

Software engineers perform some or all of the following duties:

- Analyse the requirements for the application of computer technology in real-time environments for process or machine control, instrumentation, robotics, telecommunications, environmental monitoring, remote sensing, medical and related engineering, scientific and industrial applications;
- Design and develop or co-ordinate the development, testing and implementation of computer languages and computer software packages;
- Supervise the work of programmers, technologists and technicians and other engineering and scientific personnel.

Working environment: Typically, computer engineers work in an office environment with extensive computerized equipment and networks.

Education/Training

A bachelor's degree in computer engineering or an appropriate related engineering discipline is required. Registration as a Professional Engineer (P.Eng.) by a provincial or territorial association of professional engineers is often required for employment and to practice as a computer engineer. Candidates for license must have completed an engineering program accredited by Professional Engineers Ontario or demonstrate equivalent educational qualifications, as well as have 48 months of satisfactory work experience.

Employment Prospects

Over the next five years: Strong

Employment for this occupation is expected to grow more rapidly than the average for all occupations through the year 2005 as technology becomes more sophisticated and organizations continue to adopt and integrate these technologies. Many employers have been recruiting outside Canada for workers.

The explosion in information technology has led to new opportunities in information systems engineering, software development and database management. Continuous upgrading and acquiring leading-edge skills are required to remain competitive in the fast paced job market.

Employers seek individuals with technical skills in wireless telecommunications, programming languages, network administration, relational database management systems and mainframe software applications. In addition, many employers also emphasize the need for written and verbal communication skills, and teamwork and problem solving skills.

Characteristics of Occupation

Estimated Employment in 2000: 12,900

	(%)
Male	86
Female	14
Full-time	97
Part-time	3
Self-employed	5
Employees	95
Working away from home	92
Working at home	6
No fixed workplace address	2

Employment by Region

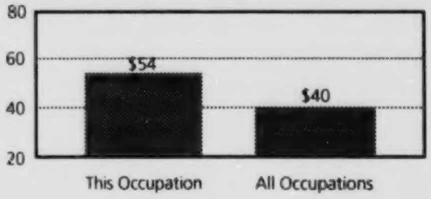
	(%) This Occupation	*(%) All Occupations*
Ottawa	26	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	0	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	4	11
Toronto	57	42
London	2	5
Windsor-Sarnia	1	5
Stratford-Bruce Peninsula	0	3
Northeast	1	5
Northwest	0	2

Main Industries of Employment

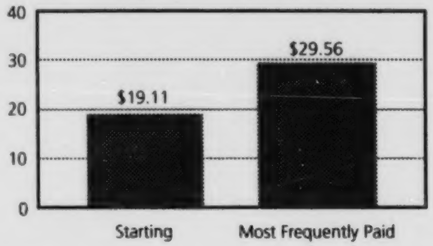
	(%)
Business service	49
Electrical and electronic products	18
Communication and other utilities	6

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Professional Engineers Ontario (www.peo.on.ca)
Association of Consulting Engineers of Canada (www.acec.ca)
Canadian Council of Professional Engineers (www.ccpe.ca)
Institute for Certification of Computer Professionals (www.iccp.org)

2151 Architects

Description

Architects conceptualize, plan and develop designs for the construction and renovation of industrial, commercial, institutional and residential buildings. Architects are employed by architectural firms, private corporations and governments, or they may be self-employed.

Common job titles: Architect; Architectural Standards Specialist; Chief Architect; Consulting Architect; Industrial and Commercial Building Architect; Residential Architect.

Typical employers: architectural, engineering and other scientific companies; federal government.

Selected Main Duties

Architects perform some or all of the following duties:

- Consult with clients to determine type, style and purpose of renovations or new building construction being considered;
- Conceptualize and design buildings and develop plans describing design specifications, building materials, costs and construction schedules;
- Prepare sketches and models for clients;
- Prepare or supervise the preparation of blueprints for use by contractors and trades persons;
- Hire and supervise contractors and other personnel involved with the construction;
- Supervise activities on construction sites to ensure compliance with specifications;
- Conduct feasibility studies and financial analyses of building projects.

Working environment: Work time is divided between desk work, meetings and the actual work site. Overtime is common in order to meet project deadlines.

Education/Training

A bachelor's degree from a recognized school of architecture and two years of experience under the supervision of a registered architect is required. An alternative route to qualify requires completion of the syllabus of studies from the Royal Architectural Institute of Canada (RAIC) plus a minimum of 3 years of on-the-job training under supervision of a registered architect. An architectural license is conditional upon attendance at Admission Course lectures and successful completion of the Architectural Registration Examinations set by the provincial association of architects. In Ontario, architects are regulated by the Ontario Association of Architects (OAA). Registration with the provincial association of architects is required. Architects usually specialize in particular types of construction such as residential, commercial, industrial or institutional. Progression to senior positions, such as chief architect, is possible with experience.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Employment in architecture is closely tied to construction activity in the residential, commercial and institutional sectors, which is expected to perform well over the next five years. Since architects are employed in the design phase of construction projects, current job prospects are good. Computer-aided design (CAD) is prevalent in this occupation and is being used to produce a wider choice of designs for customers, as well as to improve the productivity of architects. Those familiar with CAD technology will have better employment prospects.

Architects can specialize in areas such as contract administration, housing design, renovations or institutional buildings. Graduating architecture students are also applying their skills to a variety of architecture-related professions such as facilities management, graphic design and urban planning.

Characteristics of Occupation

Estimated Employment in 2000: 6,500

	(%)
Male	83
Female	17
Full-time	94
Part-time	6
Self-employed	24
Employees	76
Working away from home	78
Working at home	21
No fixed workplace address	1

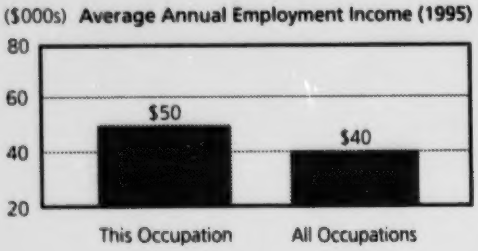
Employment by Region

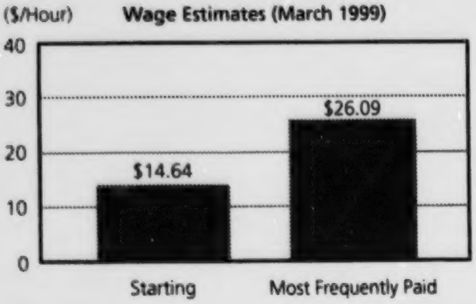
	(%) This Occupation	*(%) All Occupations*
Ottawa	14	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	5	9
Hamilton-Niagara Peninsula	7	11
Toronto	65	42
London	2	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	1	3
Northeast	1	5
Northwest	1	2

Main Industries of Employment

	(%)
Business service	85

Income and Wages





For more information

Royal Architectural Institute of Canada (www.raic.org)
Ontario Association of Architects (www.oaa.on.ca)

2153 Urban and Land Use Planners

Description

Urban and land use planners develop plans and recommend policies for managing the utilization of land, physical facilities and associated services for urban and rural areas and remote regions. They are employed by all levels of government, land developers, engineering and other consulting companies or may work as private consultants.

Common job titles: City Planner; Land Use Planner; Recreational Planner; Urban Planner.

Typical employers: architectural, engineering and other scientific companies; service firms to construction companies; management consulting firms; federal, provincial and municipal governments; insurance and real estate agencies.

Selected Main Duties

Urban and land use planners perform some or all of the following duties:

- Compile and analyse data on demographic, economic, legal, political, cultural, sociological, physical and other factors affecting land use;
- Confer with municipal, provincial and federal authorities, civic leaders, social scientists, lawyers, land developers, the public and special interest groups to formulate and develop land use or community plans;
- Prepare and recommend land development concepts and plans for zoning, subdivisions, transportation, public utilities, community facilities, parks, agricultural and other land uses;
- Prepare plans for environmental protection, such as wildlife preserves, national and provincial parks, and protection of watersheds;
- Present plans to civic, rural and regional authorities and hold public meetings to present plans, proposals or planning studies to the general public and special interest groups;
- Review and evaluate proposals for land use and development plans and prepare recommendations;
- Process applications for land development permits and administer land use plans and zoning by-laws;
- Formulate long-range objectives and policies relative to future land use and the protection of the environment;
- Supervise and co-ordinate work of urban planning technicians and technologists.

Working environment: Urban and land use planners operate mostly in an office environment. Outdoor work is sometimes required to examine the features of the land under consideration. Deadlines and tight work schedules may alter the normal 40-hour workweek.

Education/Training

A bachelor's degree in urban and regional planning, geography, architecture, engineering or a related discipline is required. A master's degree in one of these disciplines may be required. Membership in the Canadian Institute of Planners is usually required. Membership in a provincial planning institute may be required in some provinces.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to increase more slowly than the average for all occupations through 2005 as a result of financial constraint at all levels of government. Most job openings, however, will arise from the need to replace experienced planners who retire.

Two out of every three urban and land use planners work in the public sector. However, there has been some mobility from the public sector to private firms.

Increasingly, urban planners work with computerized mapping systems, which require continuous skill upgrading.

Characteristics of Occupation

Estimated Employment in 2000: 2,700

	(%)
Male	65
Female	35
Full-time	95
Part-time	5
Self-employed	6
Employees	94
Working away from home	92
Working at home	7
No fixed workplace address	1

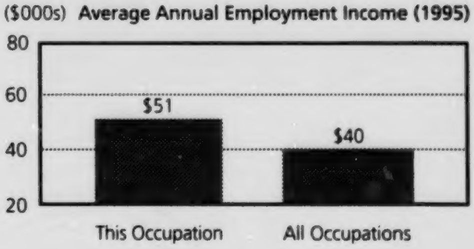
Employment by Region

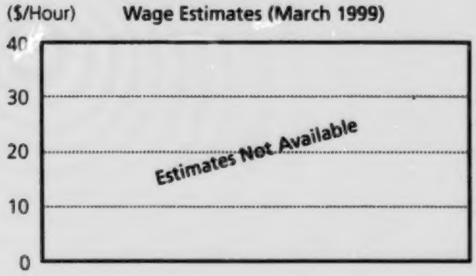
	(%) This Occupation	*(%) All Occupations*
Ottawa	8	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	11	9
Hamilton-Niagara Peninsula	11	11
Toronto	49	42
London	5	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	1	3
Northeast	3	5
Northwest	3	2

Main Industries of Employment

	(%)
Local government service	54
Business service	22
Provincial government service	10

Income and Wages





For more information

Canadian Institute of Planners (www.cip-icu.ca)
Ontario Professional Planners Institute (www.interlog.com/~oppi)

2161 Mathematicians, Statisticians and Actuaries

Description

Mathematicians and statisticians research mathematical or statistical theories, and develop and apply mathematical or statistical techniques for solving problems in such fields as science, engineering, business and social science. Actuaries apply mathematical and statistical methods to calculate premium and benefit payments for insurance and annuity purposes.

Common job titles: Actuary; Demographer; Statistical Analyst; Mathematician; Insurance Actuary.

Typical employers: federal and provincial governments; insurance companies; business services firms; management consulting firms; insurance and real estate agencies; universities.

Selected Main Duties

The following is a summary of the main duties for some occupations in this group:

- *Mathematicians* conduct research to extend mathematical knowledge in traditional areas of mathematics such as algebra, geometry, probability and logic and apply mathematical techniques to the solution of problems in scientific fields such as physical science, engineering, computer science or other fields such as operations research, business or management;
- *Statisticians* conduct research into the mathematical basis of the science of statistics, develop statistical methodology and advise on the practical application of statistical methodology. They also apply statistical theory and methods to provide information in scientific and other fields such as biological and agricultural science, business and economics, physical sciences and engineering, and the social sciences;
- *Actuaries* apply mathematics, probability, statistics and risk theory to calculate future risks associated with insurance, annuity and pension programs. They also use these techniques to provide legal evidence on the value of future earnings.

Working environment: Mathematicians and statisticians generally have structured work schedules. Individual and teamwork comprise many projects. Deadlines, overtime work, special requests for information and analysis, and travel to attend seminars or conferences may be a part of the job. Actuaries work in offices with a 40-hour workweek. Occasionally evening or weekend work may be necessary to meet deadlines.

Education/Training

Mathematicians and statisticians require a graduate degree in mathematics or statistics. Actuaries usually require an undergraduate degree or college diploma in mathematics, statistics or operations research to successfully complete professional examinations and three years of work experience in the actuarial field as an actuarial assistant or in a related position. Accreditation with the Canadian Institute of Actuaries is required.

Employment Prospects

Over the next five years: Limited

Employment for this occupation is expected to decline through 2005, with most job openings occurring as older workers retire especially in the post-secondary education sector.

An increasing percentage of mathematics graduates are now being employed in software and other computer systems jobs. Actuaries are moving into new fields such as compensation consulting, health care and financial planning. Positions also exist in colleges and universities for those with a PhD in mathematics or statistics, with a knowledge of computer systems. Operations research and marketing are also expanding areas of employment for this specialty.

Characteristics of Occupation

Estimated Employment in 2000: 3,700

	(%)
Male	62
Female	38
Full-time	93
Part-time	7
Self-employed	2
Employees	98
Working away from home	96
Working at home	2
No fixed workplace address	2

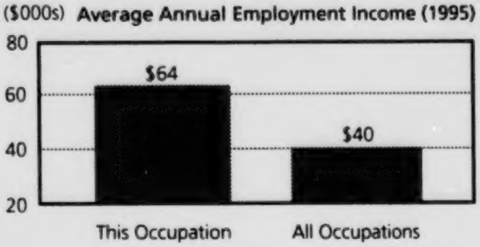
Employment by Region

	(%) This Occupation	*(%) All Occupations*
Ottawa	29	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	4	11
Toronto	54	42
London	2	5
Windsor-Sarnia	1	5
Stratford-Bruce Peninsula	1	3
Northeast	0	5
Northwest	0	2

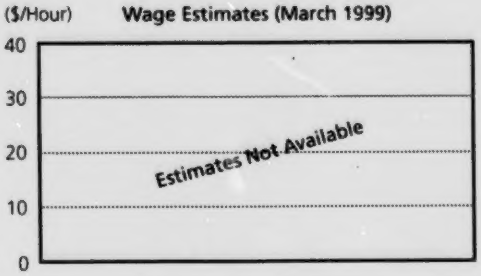
Main Industries of Employment

	(%)
Insurance	26
Business service	25
Federal government service	21

Income and Wages



($000s) Average Annual Employment Income (1995)



($/Hour) Wage Estimates (March 1999)

For more information

Canadian Institute of Actuaries (www.actuaries.ca)
Canadian Mathematical Society (www.camel.math.ca)
Statistical Society of Canada (www.ssc.ca)

2162 Computer Systems Analysts

Description

Computer systems analysts analyse information processing or computation needs, design computer systems that provide solutions to these problems or perform the needed computation, analyse databases, and supervise computer programmers.

Common job titles: Applications Analyst – Computer Systems; Computer Graphics Specialist; Electronic Data Processing Analyst; User Support Analyst.

Typical employers: computer service firms; banks and other financial institutions; federal and provincial governments; insurance companies; architectural, engineering and other scientific companies; business machine manufacturers; telecommunication companies.

Selected Main Duties

Computer systems analysts perform some or all of the following duties:

- Confer with clients regarding the nature of the information processing or computation needs a computer program is to address;
- Analyse these needs into related components which can be solved through the application of computer technology;
- Write requirement specifications for computer programs, identifying the steps in the program and the algorithms to be employed;
- Communicate program specifications to computer programmers;
- Test and implement computer programs and provide user training;
- Plan and implement computer security systems for database access control;
- Analyse and develop database directories and generate and maintain databases;
- Supervise computer programmers or other systems analysts or serve as project leader for particular systems projects.

Working environment: Computer systems analysts work in an office environment. Evening or weekend work may be necessary to meet deadlines in addition to working a standard 40-hour week. Technology is making it possible for these individuals to become telecommuters: working out of the home via the use of a modem. Also, to be successful in this field, a large amount of time is required to keep up-to-date on new technologies and their applications. Consulting and freelance work are areas of growth within this occupation.

Education/Training

A bachelor's degree, usually in computer science, mathematics, commerce or business administration or completion of a college program in computer science is usually required. Experience as a computer programmer is usually required. Knowledge of industry/business practices and organization is an advantage. Specialization in commercial or engineering and scientific applications requires specific post-secondary study or experience.

Employment Prospects

Over the next five years: Strong

Employment for this occupation is expected to grow more rapidly than the average for all occupations through the year 2005 as more businesses expand computerized operations and integrate new technologies, such as e-business. Job seekers with skills in network administration, programming languages, Internet software, database software, relational database management system, mainframe software, multimedia software and many other applications, should have excellent opportunities of finding employment. Employers across Ontario report difficulties in finding qualified workers to fill vacant positions and have been recruiting outside of Canada.

The demand for "networking" to facilitate the sharing of information, the expansion of client/server environments and a need for professionals who can develop and support Internet, Intranet and World Wide Web applications will contribute to the rising demand for systems analysts. The variety of skills needed in this occupation has prompted the Software Human Resource Council to develop an occupational skills Profile Model with 24 job streams under seven general job categories for the current Canadian software industry.

Employers also look for individuals with written and verbal communication, teamwork, planning and organizing, and personal management skills, as well as, appropriate business experience.

Characteristics of Occupation

Estimated Employment in 2000: 91,200

	(%)
Male	69
Female	31
Full-time	95
Part-time	5
Self-employed	6
Employees	94
Working away from home	90
Working at home	7
No fixed workplace address	3

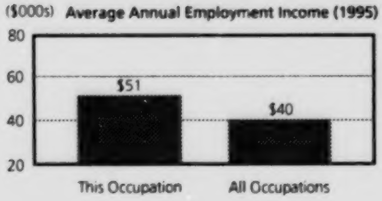
Employment by Region

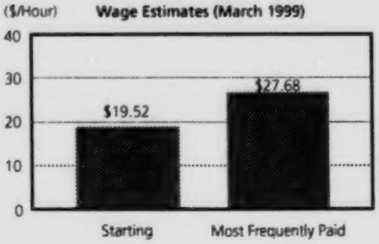
	(%) This Occupation	*(%) All Occupations*
Ottawa	20	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	6	11
Toronto	60	42
London	3	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	1	3
Northeast	1	5
Northwest	0	2

Main Industries of Employment

	(%)
Business service	38
Finance and insurance	16
Government service	11
Communication and other utilities	6
Electrical and electronic products manufacturing	5

Income and Wages





For more information

Information Resource Management Association of Canada (www.irmac.ca)
Software Human Resource Council (www.shrc.ca)
Information Technology Association of Canada (www.itac.ca)

2163 Computer Programmers

Description

Computer programmers write computer programs by coding sets of instructions into machine-readable form. They are employed in computer software and consulting firms and in programming units throughout the private and public sectors.

Common job titles: Application Programmer; Programmer Analyst; Software Development Programmer; Systems Programmer.

Typical employers: computer service firms; banks and other financial institutions; insurance companies; architectural, engineering and other scientific companies; universities; federal, provincial and municipal governments.

Selected Main Duties

Computer programmers perform some or all of the following duties:

- Write and maintain computer programs or write software packages by coding instructions and algorithms into machine-readable form;
- Test, debug, document and implement computer programs or software packages;
- Maintain existing computer programs by making minor modifications as required;
- Act as a resource person, solving computer problems for users.

Software programmers perform some or all of the following duties:

- Technically link computers and consumers by translating text, video or sound into computer code and then programming the system to respond;
- Program applications from billing systems to automated phone calling.

Working environment: A growing number of programmers work on a temporary basis to customize software and solve short-term problems for firms. Specialized temporary help agencies and consulting firms send experienced programmers on assignment that may last from several weeks to many months. Typically, computer programmers work in an office with extensive computerized operations and networks.

Education/Training

A bachelor's degree in computer science or in another discipline with a significant programming component, such as mathematics, commerce or business administration or completion of a college program in computer science is usually required. Specialization in commercial or engineering and scientific applications requires specific post-secondary study or experience.

No formal public licensing or accreditation of computer programmers exists in Ontario. However, some major software developers, such as Microsoft, have developed their own certification programs with professional certification exams available through authorized private education centers and taught by certified trainers.

Employment Prospects

Over the next five years: Good

Current employment prospects for computer programmers are good. Over the next five years, employment for this occupation will grow at a faster pace than employment for all occupations.

Programmers will need to keep up with rapidly changing programming languages and techniques. Job opportunities related to the Year 2000 problem have disappeared, so that programmers who have been working in this area will need to move into other fields. This may require updating their skills. Employers look for individuals who have strong technical, analytical and problem-solving skills. Ingenuity and innovation are highly valued, and interpersonal skills are also becoming increasingly important.

The variety of skills needed in this occupation has prompted the Software Human Resource Council to develop an occupational skills Profile Model with 24 job streams under seven general job categories for the current Canadian software industry.

Characteristics of Occupation

Estimated Employment in 2000: 53,100

	(%)
Male	75
Female	25
Full-time	92
Part-time	8
Self-employed	9
Employees	91
Working away from home	88
Working at home	8
No fixed workplace address	4

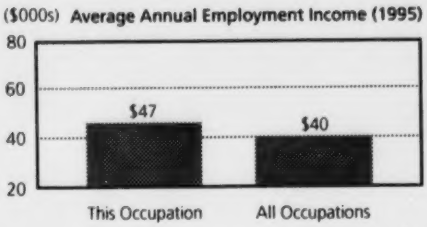
Employment by Region

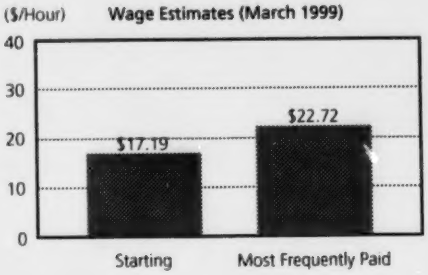
	(%) This Occupation	*(%) All Occupations*
Ottawa	19	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	6	11
Toronto	57	42
London	3	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	1	3
Northeast	2	5
Northwest	0	2

Main Industries of Employment

	(%)
Business service	44
Manufacturing	14
Finance and insurance	13
Government service	9

Income and Wages





For more information

International Programmers Guild (www.ipgnet.com)
Institute for Certification of Computer Professionals (www.iccp.org)
Software Human Resource Council (www.shrc.ca)
Ontario Association of Certified Engineering Technicians and Technologists (www.oacett.org)

2211 Applied Chemical Technologists and Technicians

Description

Applied chemical technologists and technicians may work independently or provide technical support in chemical engineering, chemical and biochemical research and analysis, industrial chemistry, chemical quality control and environmental monitoring.

Common job titles: Chemical Analyst; Chemical Research Technician; Industrial Hygiene Technologist; Mass Spectrometer Technician; Quality Control Technician – Chemical Processing.

Typical employers: architectural, engineering and other scientific companies; pharmaceutical companies; federal and provincial governments; chemical products manufacturers; universities; medical laboratories; food product companies; industrial chemicals manufacturers.

Selected Main Duties

Applied chemical technologists perform some or all of the following duties:

- Set up and conduct chemical experiments, tests and analyses using techniques such as chromatography, spectroscopy, physical and chemical separation techniques and microscopy;
- Operate and maintain laboratory equipment and apparatus and prepare solutions, reagents and sample formulations;
- Compile records and interpret experimental or analytical results;
- Develop and conduct programs of sampling and analysis to maintain quality standards of raw materials, chemical intermediates and products;
- Assist in the development of chemical engineering processes, studies of chemical engineering procurement, construction, inspection and maintenance and the development of standards, procedures and health and safety measures;
- Operate experimental chemical or petrochemical pilot plants;
- Assist in the design and fabrication of experimental apparatus.

Applied chemical technicians perform some or all of the following duties:

- Assist in setting up and conducting chemical experiments, tests and analyses;
- Operate and maintain laboratory equipment and apparatus and prepare solutions, reagents and sample formulations;
- Compile records for analytical studies;
- Assist in developing and conducting programs of sampling and analysis to maintain quality standards;
- Carry out a limited range of other technical functions in support of chemical research, tests and analyses;
- Assist in the design and fabrication of experimental apparatus.

Working environment: Technologists and technicians often work in a team setting of physical scientists and carry out specialized tasks, such as performing experiments and testing results.

Education/Training

Completion of a three-year or equivalent program for applied chemical technologists or a two-year or an equivalent program for applied chemical technicians is usually required. Several different educational backgrounds can successfully contribute entrance into an occupation within this classification. Certification in applied chemical technology or in a related field is available through provincial associations of engineering and applied science. In Ontario, the Ontario Association of Certified Engineering Technicians and Technologists (OACETT) certifies applied technologists and technicians. The certification process includes a period of supervised work experience, usually up to two years, and a professional practice examination. Some chemical technologists and technicians working in support of fundamental research in chemistry of biochemistry are university graduates.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Demand for chemical technologists and technicians should increase as chemical companies continue to research and develop new chemicals and to make more efficient use of existing chemicals. As well, the need to replace workers who retire will create additional job opportunities each year.

As technology changes, people in these occupations will have to undergo periods of retraining and professional development. Increasingly, they will also have to obtain certification in their field.

Characteristics of Occupation

Estimated Employment in 2000: 10,100

	(%)
Male	62
Female	38
Full-time	92
Part-time	8
Self-employed	1
Employees	99
Working away from home	98
Working at home	1
No fixed workplace address	1

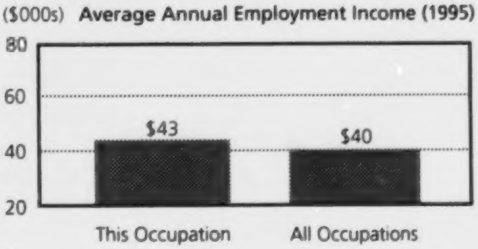
Employment by Region

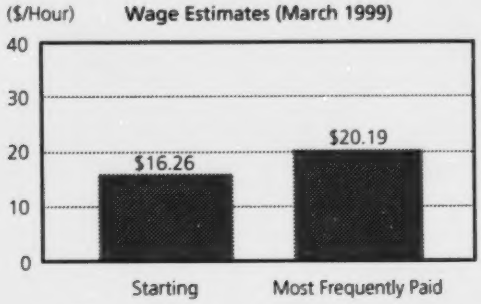
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	7	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	12	11
Toronto	39	42
London	4	5
Windsor-Sarnia	9	5
Stratford-Bruce Peninsula	2	3
Northeast	3	5
Northwest	2	2

Main Industries of Employment

	(%)
Chemical and chemical products	29
Business service	13
Government service	8
Food products	8
Educational service	7

Income and Wages





For more information

Canadian Council of Technicians and Technologists (www.cctt.ca)

Ontario Association of Certified Engineering Technicians and Technologists (www.oacett.org)

2221 Biological Technologists and Technicians

Description

Biological technologists and technicians may work independently or provide technical support and services to scientists, engineers and other professionals working in fields of agriculture, resource management, plant and animal biology, microbiology, cell and molecular biology and health sciences.

Common job titles: Agricultural Technologist; Aquaculture Technician; Food Bacteriological Technician; Plant Breeding Technician; Wildlife Biology Technician; Microbiology Technologist; Seed Technologist.

Typical employers: federal and provincial governments; universities; service firms to agriculture; dairy product companies; agricultural supplies wholesalers; pharmaceutical companies; agricultural companies.

Selected Main Duties

Biological technologists perform some or all of the following duties:

- Conduct biological, microbiological and biochemical tests and laboratory analyses in support of quality controlling food production, sanitation, pharmaceutical production and other fields;
- Perform experimental procedures in agriculture, plant breeding, animal husbandry, biology and biomedical research;
- Conduct field research and surveys to collect data and samples of water, soil, plant and animal populations;
- Analyse data and prepare reports;
- Conduct or supervise operational programs such as fish hatchery, greenhouse and livestock production programs.

Biological technicians perform some or all of the following duties:

- Assist in conducting biological, microbiological and biochemical tests and laboratory analyses;
- Perform limited range of technical functions in support of agriculture, plant breeding, animal husbandry, biology and biomedical research;
- Assist in conducting field research and surveys to collect data and samples of water, soil, plant and animal populations;
- Assist in analysis of data and preparation of reports.

Working environment: Biological technologists and technicians may work indoors in a laboratory or in field settings and have regular hours. Safety precautions remove the risk of working with disease-causing organisms or radioactive agents.

Education/Training

Completion of a three-year or equivalent program for biological technologists or a two-year or an equivalent program for biological technicians is usually required. Several different educational backgrounds can successfully contribute to entrance into an occupation within this classification. Certification in biological technology or in a related field is available through provincial associations of engineering and applied science. In Ontario, the Ontario Association of Certified Engineering Technicians and Technologists (OACETT) certifies biological technologists and technicians. The certification process includes a period of supervised work experience, usually up to two years, and a professional practice examination.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. People who work in these occupations require ongoing retraining and professional development to keep abreast of new information and changing technology. Increasingly, individuals in this field will require certification.

Computer-based competencies such as bioinformatics and molecular modelling are also becoming more important as companies and researchers deal with the integration of traditional and information sciences. Co-op programs are the preferred approach for many companies. Companies seek graduates that are at the forefront of emerging fields, such as molecular medicine, gene therapy, signal transduction, combinatorial library and genomics.

Characteristics of Occupation

Estimated Employment in 2000: 2,900

	(%)
Male	52
Female	48
Full-time	88
Part-time	12
Self-employed	3
Employees	97
Working away from home	89
Working at home	5
No fixed workplace address	6

Employment by Region

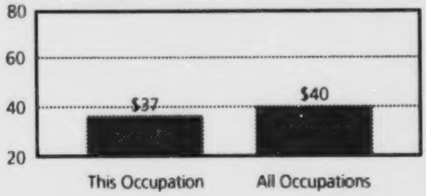
	(%) This Occupation	*(%) All Occupations*
Ottawa	15	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	16	9
Hamilton-Niagara Peninsula	8	11
Toronto	28	42
London	5	5
Windsor-Sarnia	8	5
Stratford-Bruce Peninsula	5	3
Northeast	7	5
Northwest	3	2

Main Industries of Employment

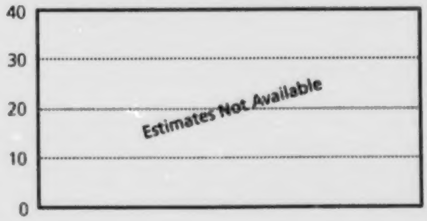
	(%)
Government service	26
Educational service	19
Agricultural and related service	13
Food products	6
Chemical and chemical products	6

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

BIOTECanada (www.biotech.ca)
Fisheries and Oceans Canada (www.ncr.dfo.ca)
Canadian Botanical Association (www.uoguelph.ca/botany/cba)
Ontario Association of Certified Engineering Technicians and Technologists (www.oacett.org)

2223 Forestry Technologists and Technicians

Description

Forestry technologists and technicians may work independently or perform technical and supervisory functions in support of forestry research, forest management, forest harvesting and forest resources conservation and protection.

Common job titles: Conservation Technician – Forestry; Extension Ranger – Forestry; Fire Suppression Officer – Forestry; Scalar Technician – Logging; Silviculture Technician.

Typical employers: forestry services firms; federal, provincial and municipal governments; pulp and paper companies; logging companies; electric power companies.

Selected Main Duties

Forestry technologists and technicians perform some or all of the following duties:

- Conduct, supervise and participate in forest inventory cruises, surveys and field measurements following accepted scientific and operational procedures;
- Assist and perform technical functions in the preparation of forest management and harvest plans using photogrammetric and mapping techniques and computerized information systems;
- Assist in planning and supervise construction of access routes and forest roads;
- Implement, supervise and perform technical functions in silvicultural operations involving site preparation, planting and tending of tree crops;
- Co-ordinate activities such as timber scaling, forest fire suppression, disease or insect control or pre-commercial thinning of forest stands;
- Supervise and perform technical functions in forest harvesting operations;
- Monitor activities of logging companies and contractors and enforce regulations such as those concerning environmental protection, resource utilization, fire safety and accident prevention;
- Provide forestry education, advice and recommendations to woodlot owners, community organizations and the general public;
- Develop and maintain computer databases;
- Supervise forest tree nursery operations;
- Provide technical support to forestry research programs in areas such as tree improvement, seed orchard operations, insect and disease surveys or experimental forestry and forest engineering research.

Working environment: Modern forestry and conservation workers spend a great deal of time working with people. Some work regular hours in an office environment or laboratory. Work is often physically demanding. Isolated work in the outdoors is also common.

Education/Training

Completion of a three-year or equivalent program for forestry technologists or a two-year or an equivalent program for forestry technicians is usually required. Several different educational backgrounds can successfully contribute entrance into an occupation within this classification. Certification in forestry technology or in a related field is available through provincial associations of engineering and applied science. In Ontario, the Ontario Association of Certified Engineering Technicians and Technologists (OACETT) certifies forestry technologists and technicians. The certification process includes a period of supervised work experience, usually up to two years, and a professional practice examination. Certification or licensing as a scaler is required for some positions.

Employment Prospects

Over the next five years: Limited

Employment for this occupation is expected to decline through 2005. Increased mechanization of logging operations and improvements in logging equipment will continue to depress demand for forestry technologists and technicians. Most job openings will result from replacement needs.

People working in these fields should plan on periods of retraining and professional development to learn new technologies. Increasingly, they will need certification from a professional organization in their field.

Characteristics of Occupation

Estimated Employment in 2000: 1,800

	(%)
Male	81
Female	19
Full-time	93
Part-time	7
Self-employed	4
Employees	96
Working away from home	90
Working at home	3
No fixed workplace address	7

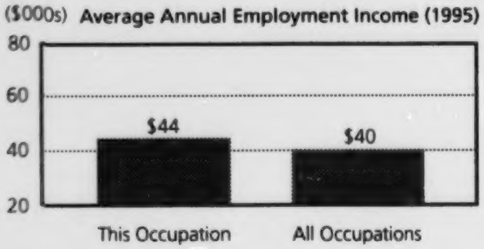
Employment by Region

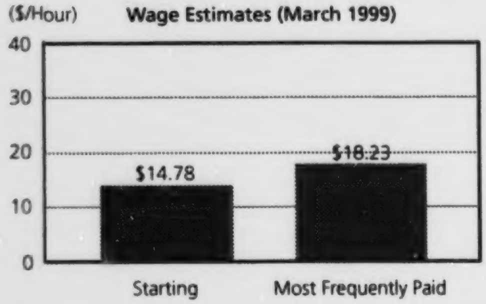
	(%) This Occupation	*(%) All Occupations*
Ottawa	6	10
Kingston-Pembroke	8	4
Muskoka-Kawarthas	4	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	2	11
Toronto	6	42
London	2	5
Windsor-Sarnia	1	5
Stratford-Bruce Peninsula	2	3
Northeast	43	5
Northwest	21	2

Main Industries of Employment

	(%)
Logging and forestry	43
Government service	29
Business service	7
Wood products	6

Income and Wages





For more information

Canadian Council of Technicians and Technologists (www.cctt.ca)
Ontario Forestry Association (www.oforest.on.ca)
Ontario Association of Certified Engineering Technicians and Technologists (www.oacett.org)

2230 Civil Engineering Technologists and Technicians and Construction Estimators

Description

Civil engineering technologists and technicians may work independently or provide technical support and services in civil engineering in fields such as structural engineering, municipal engineering, construction design and supervision, highways and transportation engineering, water resources engineering and geotechnical engineering.

Common job titles: Building Materials Technician; Construction Technologist; Highway Technician; Municipal Engineering Assistant; Structural Design Technologist; Construction Estimator.

Typical employers: architectural, engineering and other scientific companies; provincial and municipal governments; building construction firms; highway and heavy construction firms; electric power companies.

Selected Main Duties

Civil engineering technologists function as part of the engineering team and perform duties that focus on measurement and analysis, design, supervision of field installations and quality control. *Civil engineering technicians* perform similar work that is less complex but highly specialized. The main duties are to:

- Develop or assist in preparing engineering designs and drawings from preliminary concepts and sketches;
- Prepare construction specifications, cost and material estimates, project schedules and reports;
- Supervise or conduct field surveys, inspections or technical investigations of topography, soils, drainage and water supply systems, road and highway systems, buildings and structures to provide data for engineering projects; inspection and testing of construction materials;
- May supervise, monitor and inspect construction projects.

Construction estimators perform some or all of the following duties:

- Prepare estimate of probable costs of materials, labour and equipment for a construction project based on contract bids, quotations, schematic drawings and specifications;
- Advise on tendering procedures, examine and analyse tenders, recommend tender awards and conduct negotiations;
- Establish and maintain tendering process and set up cost monitoring and reporting systems and procedures;
- Prepare cost and expenditure statement at regular intervals for the duration of the project.

Working environment: Most engineering technicians and technologists work a standard workweek in a laboratory, office or construction site depending on the nature of the work. Potential work hazards include such things as electrical shocks or falling debris. Construction estimators frequently must visit work sites where safety equipment such as "hard hats" may be required.

Education/Training

Completion of a three-year or equivalent program for civil engineering technologists or a two-year or an equivalent program for civil engineering technicians is usually required. Several closely related backgrounds can successfully contribute entrance into an occupation within this classification. Certification in civil engineering technology or in a related field is available through provincial associations of engineering and applied science. In Ontario, the Ontario Association of Certified Engineering Technicians and Technologists (OACETT) certifies civil engineering technologists and technicians. The certification process includes a period of supervised work experience, usually up to two years, and a professional practice examination. Construction estimators should have a civil engineering college diploma in construction technology or several years of experience as a qualified trades person in a construction trade, such as plumbing, carpentry or electrical.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Many employers report difficulties in finding qualified workers to fill vacant positions.

Due to rapidly changing technology in this field, people in these occupations should plan on periods of retraining and professional development. New entrants with co-op experience and highly developed computer expertise are likely to enjoy the best employment prospects.

Characteristics of Occupation

Estimated Employment in 2000: 5,200

	(%)
Male	93
Female	7
Full-time	92
Part-time	8
Self-employed	6
Employees	94
Working away from home	85
Working at home	7
No fixed workplace address	8

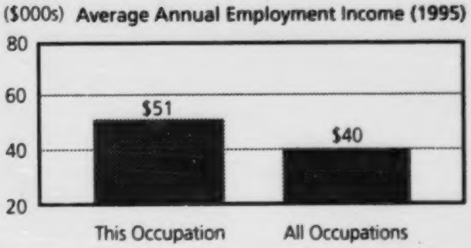
Employment by Region

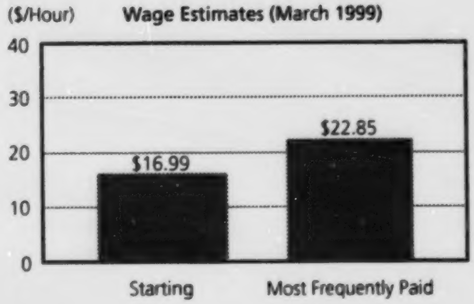
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	4	3
Kitchener-Waterloo-Barrie	11	9
Hamilton-Niagara Peninsula	13	11
Toronto	40	42
London	5	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	2	3
Northeast	6	5
Northwest	2	2

Main Industries of Employment

	(%)
Trade contracting	25
Business service	20
Building construction	16
Government service	10
Industrial and heavy (engineering) construction	6

Income and Wages





For more information

Ontario Association of Certified Engineering Technicians and Technologists (www.oacett.org)
Ontario Municipal Engineers Association (www.municipalengineers.on.ca)
Canadian Technology Human Resources Board (www.cthrb.ca)

2232 Mechanical Engineering Technologists and Technicians

Description

Mechanical engineering technologists and technicians may work independently or provide technical support and services in mechanical engineering fields such as the design, development, maintenance and testing of machines, components, tools, heating and ventilating systems, power generation and power conversion plants, and manufacturing plants and equipment.

Common job titles: Aeronautical Technologist; Heating Designer; Mould Designer; Thermal Station Technician.

Typical employers: plumbing, heating and air conditioning construction firms; architectural, engineering and other scientific companies; electric power companies; hardware, tool and cutlery manufacturers; machinery and equipment manufacturers; motor vehicle parts manufacturers; motor vehicle manufacturers; aircraft and parts manufacturers.

Selected Main Duties

Mechanical engineering technologists perform some or all of the following duties focused on measurement and analysis, design supervision of field installations and quality control:

- Prepare engineering designs, drawings and specifications for machines and components, power transmission systems, process piping, heating, ventilating and air-conditioning systems;
- Prepare cost and material estimates, project schedules and reports;
- Conduct tests and analyses of machines, components and materials to determine their performance, strength, response to stress and other characteristics;
- Design moulds, tools, dies, jigs and fixtures for use in manufacturing process;
- Inspect mechanical installations and construction;
- Prepare contract and tender documents;
- Supervise, monitor and inspect mechanical installations and construction projects;
- Prepare standards and schedules and supervise mechanical maintenance programs or operations of mechanical plants.

Mechanical engineering technicians perform similar work that is less complex but highly specialized:

- Assist in preparing engineering design, drawings and specifications;
- Carry out a limited range of mechanical tests and analyses of machines, components and materials;
- Assist in the design of moulds, tools, dies, jigs and fixtures for use in manufacturing process;
- Assist in inspection of mechanical installations and construction projects;
- Participate in the installation, repair and maintenance of machinery and equipment.

Working environment: Most engineering technicians and technologists work a standard workweek in a laboratory, office, electronics shop, industrial plant or construction site depending on the nature of the work. Potential work hazards include such things as electrical shocks or falling debris.

Education/Training

Completion of a three-year or equivalent program for mechanical engineering technologists or a two-year or an equivalent program for mechanical engineering technicians is usually required. Several different educational backgrounds can successfully contribute entrance into an occupation within this classification. Certification in mechanical engineering technology or in a related field is available through provincial associations of engineering and applied science. In Ontario, the Ontario Association of Certified Engineering Technicians and Technologists (OACETT) certifies mechanical engineering technologists and technicians. The certification process includes a period of supervised work experience, usually up to two years, and a professional practice examination.

Employment Prospects

Over the next five years: Strong

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. However, the growing use of advanced technologies, such as computer-aided design and drafting and computer simulation, will continue to impact employment growth. Job seekers with the appropriate skills and qualifications should have excellent opportunities of finding employment, as employers across Ontario report difficulties in finding qualified workers to fill vacant positions. Many employers have been recruiting outside Canada for workers.

More than half of these technologists and technicians work in the manufacturing sector, which continues to undergo modernization. People in these occupations should plan for continuous retraining and professional development to keep up with the rapidly changing technology in their field.

Characteristics of Occupation

Estimated Employment in 2000: 3,500

	(%)
Male	94
Female	6
Full-time	95
Part-time	5
Self-employed	5
Employees	95
Working away from home	93
Working at home	3
No fixed workplace address	4

Employment by Region

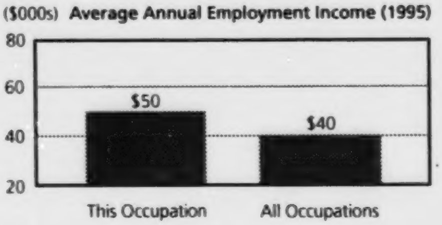
	(%) This Occupation	*(%) All Occupations*
Ottawa	7	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	4	3
Kitchener-Waterloo-Barrie	13	9
Hamilton-Niagara Peninsula	13	11
Toronto	39	42
London	5	5
Windsor-Sarnia	8	5
Stratford-Bruce Peninsula	4	3
Northeast	2	5
Northwest	1	2

Main Industries of Employment

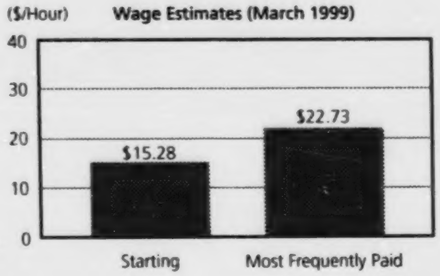
	(%)
Business service	17
Transportation equipment	14
Fabricated metal products	13
Communication and other utilities	9
Trade contracting	6

Income and Wages

Average Annual Employment Income (1995)



Wage Estimates (March 1999)



For more information

Ontario Association of Certified Engineering Technicians and Technologists (www.oacett.org)
ASME International (www.asme.org)
Canadian Technology Human Resources Board (www.cthrb.ca)

2233 Industrial Engineering and Manufacturing Technologists and Technicians

Description

Industrial engineering and manufacturing technologists and technicians may work independently or provide technical support and services in the development of production methods, facilities and systems, and the planning, estimating, measuring and scheduling of work.

Common job titles: Industrial Engineering Technician; Numerical Control Tool Programmer; Plastics Manufacturing Technician; Scheduling Technician; Time Study Analyst.

Typical employers: motor vehicle parts manufacturers; machinery and equipment manufacturers; architectural, engineering and other scientific companies; motor vehicle manufacturers; primary steel producers; pulp and paper companies; aircraft and parts manufacturers; electronic equipment manufacturers; plastic products companies.

Selected Main Duties

Technologists function as part of the engineering team and may specialize in a particular industrial area such as metal fabrication, plastics, pulp and paper, or textile manufacturing. Their duties are focused on measurement and analysis, design, supervision of field installations and quality control. They may perform some or all of the following duties:

- Develop and conduct production, inventory and quality assurance programs;
- Design plant layouts and production facilities;
- Develop and carry out industrial health, safety and fire prevention plans and programs and conduct safety training programs;
- Develop computer applications for the control of robots, numerical control machines and manufacturing processes and operations;

Technicians do simiiar work that is less complex but highly specialized. They perform some or all of the following duties:

- Assist in the design of plant layouts;
- Collect and compile operational or experimental data and assist in the development of estimates, schedules, specifications and reports;
- Collect and analyse data and samples in support of quality assurance and industrial health and safety programs;
- Develop manufacturing and processing procedures and variables, set machine or equipment controls, oversee production and inspect processes.

Working environment: Most engineering technicians and technologists work a standard workweek in a laboratory, office, electronic shop, industrial plant or construction site depending on the nature of the work. Potential work hazards include such things as electric shocks or falling debris.

Education/Training

Completion of a three-year or equivalent program for industrial engineering and manufacturing technologists or a two-year or an equivalent program for industrial engineering and manufacturing technicians is usually required. Several related educational backgrounds, such as plastics or textile technology, can successfully contribute entrance into an occupation within this classification. Certification in industrial engineering and manufacturing technology or in a related field is available through provincial associations of engineering and applied science. In Ontario, the Ontario Association of Certified Engineering Technicians and Technologists (OACETT) certifies industrial engineering and manufacturing technology technologists and technicians. The certification process includes a period of supervised work experience, usually up to two years, and a professional practice examination.

Employment Prospects

Over the next five years: Strong

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. Job seekers with the appropriate skills and qualifications can expect good job prospects as employers across Ontario report difficulties in finding qualified workers to fill vacant positions.

Majority of these technologists and technicians work in the manufacturing sector, which is continuing to undergo modernization. People working in this field should expect to need intermittent retraining and professional development to keep up with rapid technological change.

Characteristics of Occupation

Estimated Employment in 2000: 8,600

	(%)
Male	78
Female	22
Full-time	95
Part-time	5
Self-employed	1
Employees	99
Working away from home	97
Working at home	1
No fixed workplace address	2

Employment by Region

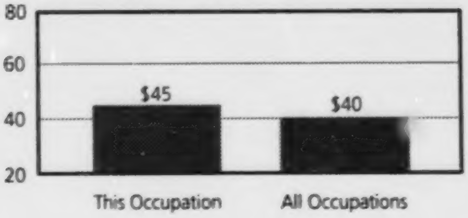
	(%) This Occupation	*(%) All Occupations*
Ottawa	7	10
Kingston-Pembroke	5	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	13	9
Hamilton-Niagara Peninsula	13	11
Toronto	38	42
London	7	5
Windsor-Sarnia	7	5
Stratford-Bruce Peninsula	3	3
Northeast	3	5
Northwest	2	2

Main Industries of Employment

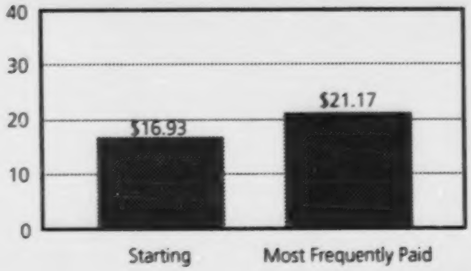
	(%)
Transportation equipment	18
Fabricated metal products	10
Business service	8
Electrical and electronic products	7
Machinery industries	6

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Ontario Association of Certified Engineering Technicians and Technologists (www.oacett.org)
Canadian Technology Human Resources Board (www.cthrb.ca)

2241 Electrical and Electronics Engineering Technologists and Technicians

Description

Electrical and electronics engineering technologists and technicians may work independently or provide technical support and services in the design, development, testing, production and operation of electrical and electronic equipment and systems.

Common job titles: Communications Technologist; Electronic Design Technologist; Planning Technician; Scheduling Technician – Manufacturing; Time Study Analyst.

Typical employers: electronic equipment manufacturers; electric power companies; architectural, engineering and other scientific companies; telecommunication companies; computer service firms; business machine manufacturers; electrical and electronic machinery and equipment wholesalers; electrical industrial equipment manufacturers.

Selected Main Duties

Electrical and *electronics engineering technologists* function as part of the engineering team and their duties focus on measurements and analysis, design, supervision of field installations and quality control. *Electrical* and *electronics engineering technicians* do similar work that is less complex but highly specialized. The main duties are to:

- Design, develop and test power equipment and systems, industrial process control systems, telecommunication, broadcast, recording and audio-visual systems, micro electronic systems and circuits, computers, computer systems and networks, and computer software;
- Supervise the building and testing of prototypes according to general instructions and established standards;
- Conduct or supervise the installation, commissioning and operation of electrical and electronic equipment and systems other than aircraft electronics or instruments;
- Carry out applied research in fields of electrical and electronic engineering and physics under the direction of scientists or engineers;
- Set up and operate specialized and standard test equipment to diagnose, test and analyse the performance of electrical and electronic components, assemblies and systems;
- Write specifications, schedules and technical reports and control schedules and budgets.

Working environment: Most engineering technicians and technologists work a standard workweek in a laboratory, office, electronics shop, industrial plant or construction site depending on the nature of the work. Dangers are related to the work conducted such as electrical shocks or falling debris.

Education/Training

Completion of a three-year or equivalent program for electrical and electronics engineering technologists or a two-year or an equivalent program for electrical and electronics engineering technicians is usually required. Several related educational backgrounds, such as in computer engineering or telecommunication technology, can successfully contribute entrance into an occupation within this classification. Certification in electrical and electronics engineering technology or in a related field is available through provincial associations of engineering and applied science. In Ontario, the Ontario Association of Certified Engineering Technicians and Technologists (OACETT) certifies electrical and electronics engineering technologists and technicians. The certification process includes a period of supervised work experience, usually up to two years, and a professional practice examination.

Employment Prospects

Over the next five years: Strong

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005 due in part to the expansion of electrical and electronic products and systems into all areas of industry and manufacturing processes. Many employers have been recruiting outside Canada for workers.

Manufacturing, business services and utilities account for most of the employment for this occupational group. Innovations and rapid change in microcomputers and telecommunications applications means that people working in this occupational group will need continuous upgrading and professional development to keep up with the changes.

Characteristics of Occupation

Estimated Employment in 2000: 12,600

	(%)
Male	85
Female	15
Full-time	94
Part-time	6
Self-employed	3
Employees	97
Working away from home	94
Working at home	2
No fixed workplace address	4

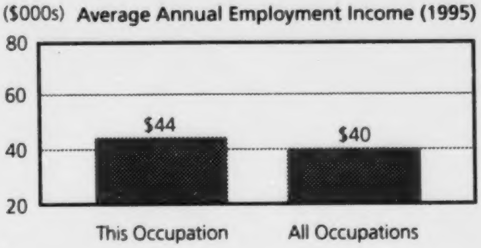
Employment by Region

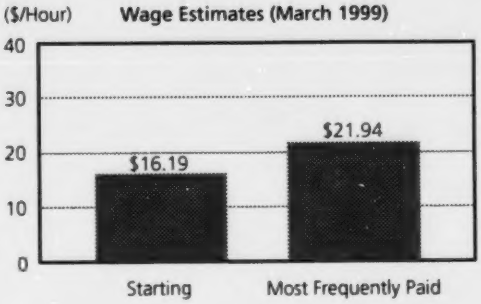
	(%) This Occupation	*(%) All Occupations*
Ottawa	30	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	8	11
Toronto	41	42
London	3	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	2	3
Northeast	2	5
Northwest	1	2

Main Industries of Employment

	(%)
Electrical and electronic products	26
Business service	16
Communication and other utilities	15
Wholesale trade	12

Income and Wages





For more information

Ontario Association of Certified Engineering Technicians and Technologists (www.oacett.org)
Canadian Technology Human Resources Board (www.cthrb.ca)

2242 Electronic Service Technicians (Household and Business Equipment)

Description

Electronic service technicians service and repair household and business electronic equipment such as audio and video systems, computers and peripherals, office equipment and other consumer electronic equipment and assemblies.

Common job titles: Alarm System Technician; Computer Service Technician; Field Service Technician – Electronic Products; Television Servicer.

Typical employers: computer service firms; electrical and electronic machinery and equipment wholesalers; appliance, television, radio and stereo stores; machinery and equipment wholesalers; business machine manufacturers; electrical construction firms; business services firms; machinery and equipment rental and leasing firms; electronic equipment manufacturers.

Selected Main Duties

Electronic service technicians perform some or all of the following duties:

- Install, maintain and repair household and business electronic equipment, such as televisions, radios, videocassette recorders, stereo equipment, photocopiers, computers and peripherals;
- Inspect and test electronic equipment, components and assemblies using multimeters, circuit testers, oscilloscopes, logic probes and other electronic test instruments, tools and equipment;
- Diagnose and locate circuit, component and equipment faults;
- Adjust, align, replace or repair electronic equipment, assemblies and components following equipment manuals and schematics and using soldering tools and other hand and power tools;
- Complete work orders, test and maintain reports;
- Supervise other electronic equipment service technicians.

Working environment: Work is usually indoors, although the work site constantly changes, i.e., client's home. Electronic service technicians are often exposed to hazards, which require the use of safety equipment. Employment in this occupation is predominately 35 to 40 hours per week. Work is busiest between September and May.

Education/Training

Completion of a two to three-year college program in electronics or completion of a four-year apprenticeship program in electronic servicing and repair or completion of high school or college courses in electronics and on-the-job training is required. Trade certification for electronic technician, consumer products, is voluntary in Ontario. Although the certificate is not mandatory, it indicates a certain level of achievement and is often required by some employers. The Ontario Association of Certified Engineering Technicians and Technologists (OACETT) also certifies electronics service technicians. The certification process includes a period of supervised work experience, usually up to two years, and a professional practice examination.

Employment Prospects

Over the next five years: Strong

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. Many employers report difficulties in finding qualified workers to fill vacant positions and are actively recruiting outside of Canada.

Popularity of videocassette recorders, compact discs and other entertainment applications is high. These products also are undergoing rapid changes in their capabilities. People working in these occupations should expect to need intermittent retraining and professional development to keep up with rapid technological changes.

Firms recruit new graduates from community colleges. They also utilize informal networks and newspaper advertisements as methods of seeking new employees.

Characteristics of Occupation

Estimated Employment in 2000: 36,400

	(%)
Male	91
Female	9
Full-time	89
Part-time	11
Self-employed	9
Employees	91
Working away from home	80
Working at home	6
No fixed workplace address	14

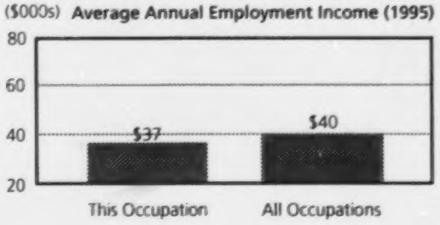
Employment by Region

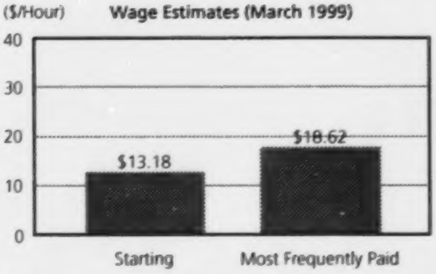
	(%) This Occupation	*(%) All Occupations*
Ottawa	14	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	8	11
Toronto	53	42
London	4	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	1	3
Northeast	4	5
Northwest	1	2

Main Industries of Employment

	(%)
Wholesale trade	26
Business service	25
Manufacturing	12
Retail trade	9

Income and Wages





For more information

Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/appren.html)

Ontario Association of Certified Engineering Technicians and Technologists (www.oacett.org)

2243 Industrial Instrument Technicians and Mechanics

Description

Industrial instrument technicians and mechanics repair, maintain, calibrate, adjust and install industrial measuring and controlling instrumentation.

Common job titles: Industrial Instrument Mechanic; Instrumentation Technician – Industrial; Process Control Equipment Mechanic.

Typical employers: primary steel producers; electric power companies; pulp and paper companies; architectural, engineering and other scientific companies; machinery and equipment wholesalers; mining companies; scientific and professional equipment manufacturers; refined petroleum products manufacturers; industrial chemicals manufacturers.

Selected Main Duties

Industrial instrument technicians and mechanics perform some or all of the following duties:

- Consult manufacturer's manuals to determine tests and maintenance procedures for instruments used for measuring and controlling flow, level, pressure, temperature and other variables in manufacturing and processing;
- Inspect and test operation of instruments and systems to diagnose faults using testing devices;
- Repair and adjust system components or remove and replace defective parts;
- Calibrate components and instruments according to manufacturers' specifications;
- Perform scheduled preventive maintenance work and complete test and maintenance reports;
- Install new control instruments on existing plant equipment.

Working environment: The work environment for repairers who work in manufacturing are very similar to those of production workers. Common shop injuries and cramped conditions, when performing repairs, are constant threats. A standard 40-hour workweek is common, but emergencies can call an individual in at any time of the day.

Education/Training

Completion of secondary school is usually required. Completion of a four-year apprenticeship program in industrial instrument repair or completion of a two-year college program in industrial instrumentation technology and several years of work experience are usually required for trade certification. Red Seal trade certification allows for inter-provincial mobility. Certification can also be obtained from the Ontario Association of Engineering Technicians and Technologists (OACETT) upon meeting educational requirements, supervised work experience, and writing a professional practice examination.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. As more firms introduce automated production equipment, industrial instrument technicians and mechanics are needed to ensure these machines are well maintained. Many employers have been recruiting outside Canada for workers.

Manufacturing and communications and utilities industries are the main sources of jobs for this occupation. However, there is greater reliance on computer-based control systems in industrial instrumentation. People working in this occupation should expect to need intermittent retraining and professional development to keep up with rapid technological change.

Characteristics of Occupation

Estimated Employment in 2000: 2,700

	(%)
Male	97
Female	3
Full-time	97
Part-time	3
Self-employed	1
Employees	99
Working away from home	96
Working at home	1
No fixed workplace address	3

Employment by Region

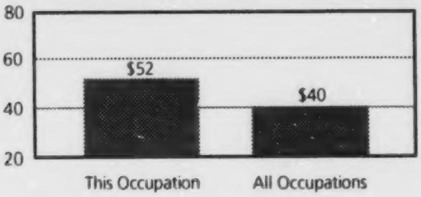
	(%) This Occupation	*(%) All Occupations*
Ottawa	12	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	5	9
Hamilton-Niagara Peninsula	14	11
Toronto	28	42
London	2	5
Windsor-Sarnia	13	5
Stratford-Bruce Peninsula	7	3
Northeast	9	5
Northwest	4	2

Main Industries of Employment

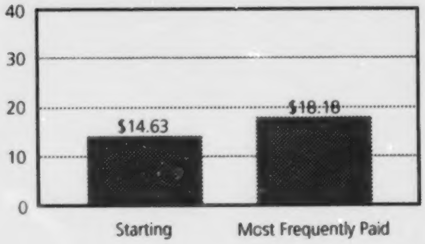
	(%)
Communication and other utilities	17
Chemical and chemical products	12
Primary metal	8
Paper and allied products	7
Wholesale trade	7

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/appren.html)
Canadian Technology Human Resources Board (www.cthrb.ca)
Canadian Council of Technicians and Technologists (www.cctt.ca)
Ontario Association of Certified Engineering Technicians and Technologists (www.oacett.org)

2244 Aircraft Instrument, Electrical and Avionics Mechanics, Technicians and Inspectors

Description

This group includes mechanics and technicians who adjust, repair and overhaul aircraft instrument, electrical, or avionics systems on aircraft. It also includes avionics inspectors who inspect instrument, electrical and avionics systems following assembly, modification, repair or overhaul.

Common job titles: Aircraft Electrical Technician; Avionics Inspector; Instrument Inspector – Aircraft; Instrument Overhaul and Repair Mechanic.

Typical employers: aircraft and parts manufacturers; airline companies; defence services; federal government; scientific and professional equipment manufacturers; service firms to air transport companies; electronic equipment manufacturers; architectural, engineering and other scientific companies; machinery and equipment wholesalers.

Selected Main Duties

The following is a summary of main duties for selected occupations in this group:

- *Aircraft instrument mechanics and technicians* repair and overhaul, install and test aircraft instruments;
- *Aircraft electrical mechanics and technicians* repair and overhaul, modify, install and test aircraft electrical systems and equipment;
- *Avionics mechanics and technicians* repair and overhaul, modify, adjust and test aircraft electronic systems and equipment, including communications and navigation equipment;
- *Avionics inspectors* inspect and test aircraft instrument, electrical and avionics systems and certify that the installation, maintenance, repair and overhaul of these systems meet Transport Canada and company standards of performance and safety.

Working environment: Inspector, technicians and mechanics in this field usually work indoors, with some work outdoors in the case of inspectors and mechanics. Some electrical hazards are present, but safety equipment reduces the risk greatly.

Education/Training

Aircraft instrument and avionics mechanics and technicians are required to complete two to three-year college program in avionics or electronics or a four-year apprenticeship program. Aircraft electrical mechanics and technicians usually require the completion of a college program as an electrical or electronic technician. Several years of on-the-job training are required for all mechanics and technicians in this group. Mechanics and technicians who sign maintenance releases require an Aircraft Maintenance Engineer's (AME) license issued by Transport Canada.

Avionics inspectors require the completion of a two to three-year college program in avionics or electronics; three to five years of experience as an avionics mechanic or technician, and an AME license with endorsements for avionics systems. Avionics inspectors may also acquire further endorsements to their AME license allowing them to inspect and certify a broader range of aircraft and avionics systems. An AME license can be obtained by fulfilling the education and training requirements and passing Transport Canada AME examinations.

Employment Prospects

Over the next five years: Good

While job growth will create new positions, the majority of job openings will stem from replacement needs as older workers retire. Major commercial airplane manufacturers, such as Boeing and Airbus, forecast steady growth in regional and commuter airplanes over the next decade. As a result, airline industry officials foresee increasing demand in a series of maintenance and repair related skills over the next several years.

People working in this occupation can expect to need intermittent retraining and professional development to keep up with rapid technological change.

Characteristics of Occupation

Estimated Employment in 2000: 1,800

	(%)
Male	93
Female	7
Full-time	97
Part-time	3
Self-employed	1
Employees	99
Working away from home	97
Working at home	2
No fixed workplace address	1

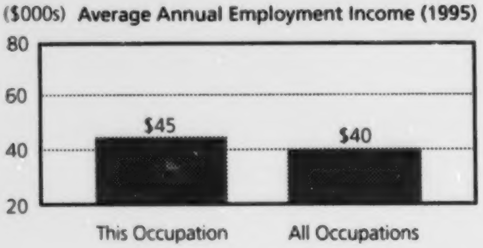
Employment by Region

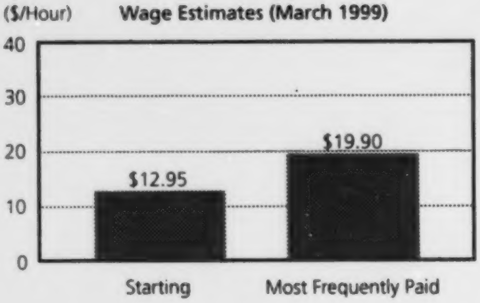
	(%) This Occupation	*(%) All Occupations*
Ottawa	30	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	0	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	7	11
Toronto	42	42
London	3	5
Windsor-Sarnia	1	5
Stratford-Bruce Peninsula	1	3
Northeast	3	5
Northwest	2	2

Main Industries of Employment

	(%)
Transportation	40
Transportation equipment manufacturing	35
Government service	10

Income and Wages





For more information

Canadian Aviation Maintenance Council (www.camc.ca)
Transport Canada (www.tc.gc.ca)
Aerospace Industries Association of Canada (www.aiac.ca)

2251 Architectural Technologists and Technicians

Description

Architectural technologists and technicians may work independently or provide technical assistance to professional architects and civil design engineers in conducting research, preparing drawings, architectural models, specifications and contracts and in supervising construction projects.

Common job titles: Architectural Design Technician; Architectural Design Technologist; Building Technologist – Residential.

Typical employers: architectural, engineering and other scientific companies; federal and provincial governments; residential building developers.

Selected Main Duties

Architectural technologists and technicians perform some or all of the following duties:

- Assist in the development of architectural designs;
- Analyse building codes, by-laws, space requirements, site requirements and other technical documents and reports;
- Prepare drawings, specifications, cost estimates and listings of quantities of material from conceptual drawings and instructions;
- Construct architectural and display models;
- Prepare contract and bidding documents;
- Supervise drafters, technicians and technologists on the architectural team;
- Supervise construction projects and co-ordinate, monitor and inspect work done by others.

Working environment: Working with architects and civil engineers engaged in building design, architectural technologists and technicians often operate on-site and therefore must take precautions against the risks associated with construction. Hours will be greater as deadlines approach and during particularly intense construction periods. Some development of detailed working drawings will require work indoors.

Education/Training

Completion of a one to three-year college program in architectural technology or a related subject is usually required. Certification in architectural technology or in a related field through provincial associations of engineering and applied science technologists and technicians may also be required by employers. In Ontario, the Ontario Association of Certified Engineering Technicians and Technologists (OACETT) certifies architectural engineering (building design) technologists and technicians. The certification process includes completion of a two to three-year college program, a period of supervised work experience, usually up to two years, and a professional practice examination.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through 2005. Employment levels for architectural technologists and technicians are heavily dependent on activity in the construction sector. Current use of computerized design is transforming this occupation. Workers will need to develop the appropriate skills and will need intermittent retraining and professional development to keep up with new technologies.

The use of computer-aided design technology is blurring the boundary between the work of engineers, architects and technologists. Many young engineers and architects are now doing conception design and production tasks once done by technicians and technologists.

Characteristics of Occupation

Estimated Employment in 2000: 2,200

	(%)
Male	81
Female	19
Full-time	90
Part-time	10
Self-employed	18
Employees	82
Working away from home	79
Working at home	17
No fixed workplace address	4

Employment by Region

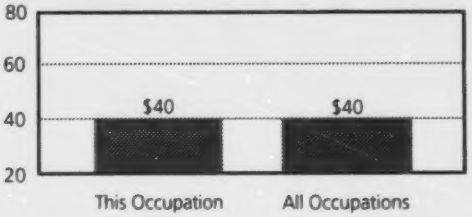
	(%) This Occupation	*(%) All Occupations*
Ottawa	15	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	5	11
Toronto	55	42
London	4	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	1	3
Northeast	4	5
Northwest	1	2

Main Industries of Employment

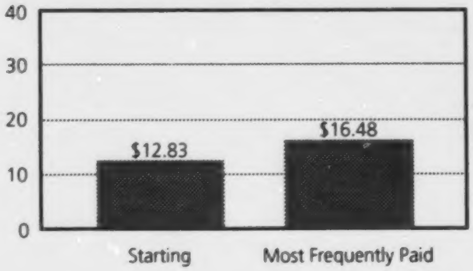
	(%)
Business service	71
Government service	9
Construction	5

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Canadian Council of Technicians and Technologists (www.cctt.ca)
Ontario Association of Architects (www.oaa.on.ca)
Ontario Association of Certified Engineering Technicians and Technologists (www.oacett.org)

2252 Industrial Designers

Description

Industrial designers conceptualize, create and produce designs for consumer, industrial and business products.

Common job titles: Furniture Designer; Industrial Design Consultant; Industrial Designer; Package Designer; Product Designer.

Typical employers: architectural, engineering and other scientific companies; business services firms; household furniture makers; machinery and equipment manufacturers; manufacturing companies; motor vehicle parts manufacturers; sporting goods and toy manufacturers; electronic equipment manufacturers; household furniture stores.

Selected Main Duties

Industrial designers perform some or all of the following duties:

- Consult with clients, engineers or production specialists to establish product requirements;
- Analyse the intended use of product and user preferences;
- Conduct research into cost, properties of production materials and methods of production;
- Prepare design concepts, sketches or models for approval;
- Prepare specifications and guidelines for production and construct prototype of design;
- Consult with engineers and production staff during manufacturing stage.

Working environment: Designers spend much of their time in consultation with clients or employers and other specialists in the field. They spend long hours completing projects in time for urgent deadlines. The work environment may be an overcrowded workroom or an office, on the plant floor or wherever the skills of an industrial designer are required.

Education/Training

A university degree in industrial design, architecture or engineering or a college diploma in industrial design is required. Creative ability, as demonstrated by a portfolio of work, is required. Depending on the specific work, diverse post-secondary academic paths can lead to jobs in industrial design.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. The quality of design plays an important role in the success of many Canadian products. However, increasing use of computerized design and engineering technology is transforming this occupation. Workers will need to develop appropriate skills and will need intermittent retraining and professional development to keep up with new technologies. Employers now look for skills in drafting software as well as Internet, spreadsheet and database applications.

Characteristics of Occupation

Estimated Employment in 2000: 2,900

	(%)
Male	79
Female	21
Full-time	92
Part-time	8
Self-employed	10
Employees	90
Working away from home	87
Working at home	10
No fixed workplace address	3

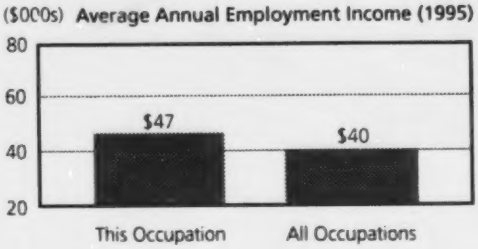
Employment by Region

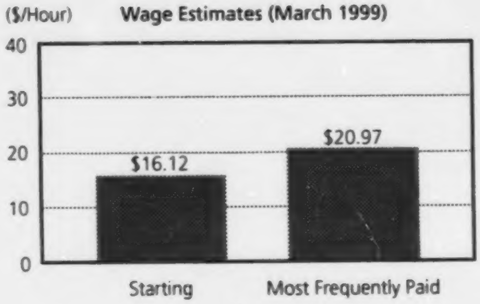
	(%) This Occupation	*(%) All Occupations*
Ottawa	12	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	11	9
Hamilton-Niagara Peninsula	10	11
Toronto	51	42
London	5	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	1	3
Northeast	1	5
Northwest	0	2

Main Industries of Employment

	(%)
Business service	25
Transportation equipment	11
Furniture and fixture	8
Fabricated metal products	7
Electrical and electronic products	7

Income and Wages





For more information

Packaging Association of Canada (www.pac.ca)

2253 Drafting Technologists and Technicians

Description

Drafting technologists and technicians prepare engineering designs, drawings and related technical information working independently, in multidisciplinary engineering teams or in support of engineers, architects or industrial designers.

Common job titles: Architectural Draftsperson; Computer Aided Design and Drafting Technologist; Design and Drafting Technologist; Engineering Design and Drafting Technologist; Mechanical Draftsperson.

Typical employers: architectural, engineering and other scientific companies; electric power companies; machinery and equipment manufacturers; municipal governments; telecommunication companies; electrical industrial equipment manufacturers.

Selected Main Duties

Drafting technologists perform some or all of the following duties:

- Develop and prepare engineering designs and drawings from preliminary concepts, sketches, engineering calculations, specification sheets and other data;
- Operate computer aided design and drafting stations;
- Complete documentation packages and produce drawing sets;
- Check and verify design drawings to conform to specifications and design data;
- Write technical reports;
- Prepare contracts and tender documents;
- Prepare construction specifications, costs and material estimates;
- Supervise and train other technologists, technicians and drafters.

Drafting technicians perform some or all of the following duties:

- Develop and prepare engineering drawings, plans, diagrams or layouts from sketches;
- Operate computer aided drafting equipment and/or a conventional drafting station;
- Examine drawings to check for errors.

Working environment: Although draftspersons generally work within a large departments ranging from two to three hundred, many are also working independently.

Education/Training

Completion of a three-year or equivalent program for drafting technologists or a two-year or an equivalent program for drafting technicians is usually required. Several different educational backgrounds can successfully contribute to entrance into an occupation within this classification. Certification in drafting technology or in a related field is available through provincial associations of engineering and applied science. In Ontario, the Ontario Association of Certified Engineering Technicians and Technologists (OACETT) certifies drafting technologists and technicians. The certification process includes a period of supervised work experience, usually up to two years, and a professional practice examination. Certificate of qualification for draftspersons is also available through Ontario's Apprenticeship Program.

Employment Prospects

Over the next five years: Limited

Employment for this occupation is expected to decline through 2005 because of the greater use of highly effective computer-aided design equipment by architects and engineers, as well as drafters. Most job openings will result from the need to replace workers who retire.

Rapid diffusion of computer-aided design technology will increase skill requirements. Among the technical skills employers look for in these workers are those for using drafting and Internet software, programming languages and network administration.

Characteristics of Occupation

Estimated Employment in 2000: 11,200

	(%)
Male	82
Female	18
Full-time	92
Part-time	8
Self-employed	11
Employees	89
Working away from home	86
Working at home	11
No fixed workplace address	3

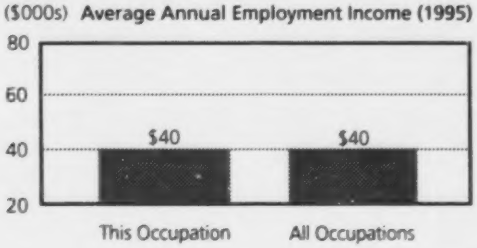
Employment by Region

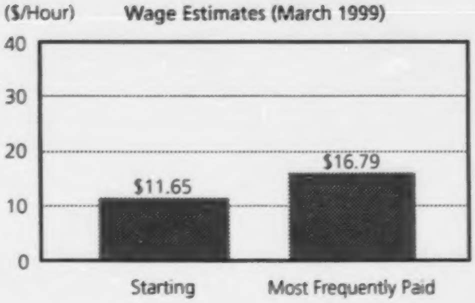
	(%) This Occupation	*(%) All Occupations*
Ottawa	13	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	12	11
Toronto	43	42
London	4	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	1	3
Northeast	4	5
Northwest	2	2

Main Industries of Employment

	(%)
Business service	46
Manufacturing	29
Communication and other utilities	7
Government service	6

Income and Wages





For more information

Canadian Aviation Maintenance Council (www.camc.ca)
Ontario Association of Certified Engineering Technicians and Technologists (www.oacett.org)
Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/appren.html)

2254 Survey Technologists and Technicians

Description

Survey technologists and technicians conduct or participate in surveys to determine the exact locations and relative positions of natural features and other structures on the earth's surface. Survey technologists and technicians may specialize in one of the following types of surveys: geodetic, topographic, legal or engineering.

Common job titles: Engineering Survey Technologist; Land Survey Technician; Topographic Survey Technician; Transit Operator – Surveying.

Typical employers: architectural, engineering and other scientific companies; colleges and other related schools; service firms to transportation companies; federal, provincial and municipal governments.

Selected Main Duties

Survey technologists perform some or all of the following duties:

- Assist survey engineers or professional surveyors to develop methods and procedures for conducting field surveys;
- Conduct field surveys and operate survey instruments to measure distance, angles, elevations and contours;
- Record measurements and other information obtained during field survey activities;
- Analyse latitude, longitude and angles and compute trigonometrical and other calculations to plot features, contours and areas to a specific scale;
- Prepare detailed drawings, charts and plans and survey notes and reports;
- Supervise and co-ordinate field survey activities.

Survey technicians perform some or all of the following duties:

- Participate in field surveys and operate survey instruments and devices;
- Keep records, measurements and other survey information in systematic order;
- Assist in the calculation, analysis and computation of measurements obtained during field surveys;
- Assist in the preparation of detailed drawings, charts and plans;

Working environment: Surveying work is painstaking and detailed, but technological innovations have revolutionized surveying work and simplified the job.

Education/Training

Completion of a three-year or equivalent program for survey technologists or a two-year or an equivalent program for survey technicians is usually required. Several different educational backgrounds can successfully contribute to entrance into an occupation within this classification. Certification in drafting technology or in a related field is available through provincial associations of engineering and applied science. In Ontario, the Ontario Association of Certified Engineering Technicians and Technologists (OACETT) certifies survey technologists and technicians. The certification process includes a period of supervised work experience, usually up to two years, and a professional practice examination.

Employment Prospects

Over the next five years: Limited

Employment for this occupation is expected to decline through 2005 with most job openings occurring as older workers retire. Jobs for these workers are heavily concentrated among firms that provide business services to other businesses and to the government service sector. Increasing use of computer-based technologies, such as mapping and satellite positioning systems, are transforming this occupation. Workers will need to develop appropriate skills and will need intermittent retraining and professional development to keep up with the new technologies.

There is some mobility among the various fields of surveying such as legal surveys, engineering surveys, mining surveys and geophysical surveys.

Characteristics of Occupation

Estimated Employment in 2000: 1,300

	(%)
Male	92
Female	8
Full-time	88
Part-time	12
Self-employed	4
Employees	96
Working away from home	79
Working at home	2
No fixed workplace address	19

Employment by Region

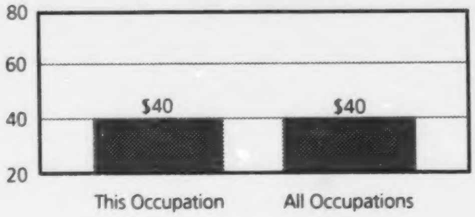
	(%) This Occupation	*(%) All Occupations*
Ottawa	15	10
Kingston-Pembroke	11	4
Muskoka-Kawarthas	7	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	8	11
Toronto	26	42
London	3	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	3	3
Northeast	11	5
Northwest	3	2

Main Industries of Employment

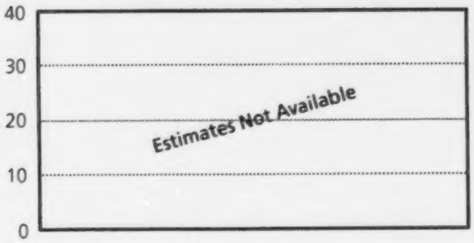
	(%)
Business service	56
Government service	20
Construction	12
Transportation industries	6

Income and Wages

($000s) Average Annual Employment Income (1995)



($/Hour) Wage Estimates (March 1999)



For more information

Association of Canada Lands Surveyors (infoweb.magi.com/~aclsaatc)
Ontario Association of Certified Engineering Technicians and Technologists (www.aocett.org)
Association of Ontario Land Surveyors (www.aols.org)

2271 Air Pilots, Flight Engineers and Flying Instructors

Description

Pilots fly fixed wing aircraft and helicopters to provide air transportation and other services. Flight engineers (second officers) monitor the functioning of the aircraft during flight and may assist in flying the aircraft. Flying instructors teach flying techniques and procedures to students and licensed pilots.

Common job titles: Air Pilot; Chief Flying Instructor; Chief Pilot; Co-pilot; Test Pilot.

Typical employers: airline companies; service firms to air transport companies; federal and provincial governments; aircraft and parts manufacturers.

Selected Main Duties

Pilots perform some or all of the following duties:

- Fly fixed wing aircraft or helicopters to transport passengers and freight;
- Provide services such as search and rescue, aerial surveying or spraying and crop dusting;
- Direct activities of aircraft crew during flight as captain of the aircraft;
- Co-pilot aircraft and perform captain's duties, if required, as first officer;
- Test new aircraft to evaluate aircraft performance;
- Train pilots to use new equipment, or prepare them for examination to re-validate or upgrade existing licenses.

Flight engineers (second officers) perform some or all of the following duties:

- Monitor operation of engines, fuel consumption and functioning of aircraft systems during flight;
- Assist captain and first officer in operation of aircraft as second officer.

Flying instructors perform some or all of the following duties:

- Instruct student pilots in procedures and techniques of flying aircraft and in ground-school subjects such as navigation, radio procedures and flying regulations.

Working environment: Jobs in this grouping require individuals to be away from home for days at a time.

Education/Training

Pilots and flight engineers require completion of secondary school and graduation from a certified flying or aviation school and a commercial pilot's license. Additional licenses or endorsements to fly different types of aircraft are required for pilots. A university degree or college diploma may be required. Structured training may be provided by employers.

For flight instructors completion of secondary school and graduation from a certified flying or aviation school and a commercial pilot's license are required. Transport Canada ratings and endorsements to provide instruction on different types of aircraft are required. A university degree or college diploma may also be required.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to increase more slowly than the average for all occupations through 2005. Most job openings will be created as older workers retire. Continued restructuring and increased competition in the air industry will affect the employment prospects for these occupations. However, pilots trained in Canada can also work in other countries. For example, Canada's licensing standards are similar to those of the United States, although additional hours of courses and a written test are required. Technology is also impacting on the skill requirements for this occupational group.

Characteristics of Occupation

Estimated Employment in 2000: 2,000

	(%)
Male	97
Female	3
Full-time	94
Part-time	6
Self-employed	3
Employees	97
Working away from home	75
Working at home	1
No fixed workplace address	24

Employment by Region

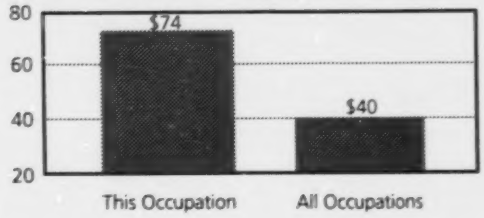
	(%) This Occupation	*(%) All Occupations*
Ottawa	11	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	19	9
Hamilton-Niagara Peninsula	10	11
Toronto	33	42
London	4	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	2	3
Northeast	7	5
Northwest	7	2

Main Industries of Employment

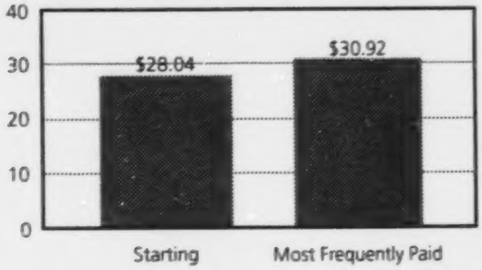
	(%)
Transportation	90

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Air Transport Association of Canada (www.atac.ca)
Canadian Seaplane Pilots Association (www.canadianseaplane.com)
Transport Canada (www.tc.gc.ca)

3111 Specialist Physicians

Description

This group includes specialist physicians in clinical medicine, in laboratory medicine and in surgery. Specialists in clinical medicine diagnose and treat diseases and physiological or psychiatric disorders and act as consultants to other physicians. Specialists in laboratory medicine study the nature, cause and development of diseases in humans. Specialists in surgery perform and supervise surgical procedures.

Common job titles for specialists in clinical medicine: Anaesthetist; Cardiologist; Dermatologist; Endocrinologist; Gastroenterologist; Geriatrician; Nephrologist; Neurologist; Paediatrician; Physiatrist; Psychiatrist; Radiation Oncologist; Rheumatologist. Common job titles for specialists in laboratory medicine: Anatomical Pathologist; General Pathologist; Haematological Pathologist; Medical Biochemist; Medical Microbiologist; Neuropathologist. Common job titles for specialists in surgery: Cardiovascular and Thoracic Surgeon; General Surgeon; Gynaecologist; Neurosurgeon; Obstetrician.

Typical employers: offices of physicians, surgeons and dentists; hospitals; universities; medical laboratories.

Selected Main Duties

Specialists in clinical medicine perform some or all of the following duties:

- Diagnose and treat diseases and physiological or psychiatric disorders;
- Order laboratory tests, x-rays and other diagnostic procedures;
- Prescribe medication and treatment and refer patients for surgery;
- Conduct medical research.

Specialists in laboratory medicine perform some or all of the following duties:

- Study the nature, cause and development of diseases in humans and the structural and functional changes caused by diseases;
- Conduct microscopic and chemical analyses of laboratory samples and specimens;
- Supervise laboratory activities.

Specialists in surgery perform some or all of the following duties:

- Assess patients' diseases or disorders to determine appropriate surgical procedures;
- Perform and supervise surgical procedures to correct physical abnormalities and deficiencies and repair injuries.

Working environment: Most doctors are self-employed with their incomes based on the bills they submit to the publicly funded Medicare system. Specialists in clinical medicine usually work in private practice or in a hospital while those in laboratory medicine and in surgery usually work in hospitals.

Education/Training

All specialist physicians require graduation from an approved medical school, specific specialty training and completion of the qualifying examination of the Royal College of Physicians and Surgeons of Canada and licensure by the provincial licensing authority (College of Physicians and Surgeons of Ontario). All specialists require post-graduate training ranging from three or more years depending upon the specialty. Admission requirements to medical schools may vary.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. Many more job openings will be created each year from the need to replace workers who retire. Demand for services of specialist physicians will be influenced by the rise in ageing population. The restructuring in the health care field will also influence the demand. As well, specialists in some fields and geographic locations are in short supply.

Technical progress in telecommunications may mean that specialists can provide services at a distance, perhaps in collaboration with general practitioners.

Characteristics of Occupation

Estimated Employment in 2000: 10,800

	(%)
Male	71
Female	29
Full-time	91
Part-time	9
Self-employed	51
Employees	49
Working away from home	95
Working at home	2
No fixed workplace address	3

Employment by Region

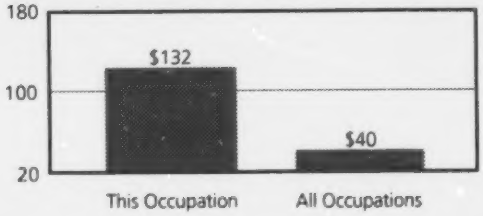
	(%) This Occupation	*(%) All Occupations*
Ottawa	16	10
Kingston-Pembroke	5	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	3	9
Hamilton-Niagara Peninsula	10	11
Toronto	48	42
London	8	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	1	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

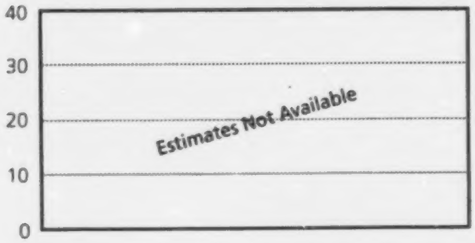
	(%)
Health and social service	92

Income and Wages

($000s) Average Annual Employment Income (1995)



($/Hour) Wage Estimates (March 1999)



For more information

College of Physicians and Surgeons of Ontario (www.cpso.on.ca)

Royal College of Physicians and Surgeons of Canada (www.rcpsctest.medical.org)

3112 General Practitioners and Family Physicians

Description

General practitioners and family physicians diagnose and treat the diseases, physiological disorders and injuries of patients. They usually work in private practice. Residents and interns in training to be general practitioners and family physicians are included in this unit group.

Common job titles: Family Physician; General Practitioner (GP); Intern, General Practice; Medical Doctor (MD); Resident Physician, General Practice.

Typical employers: offices of physicians, surgeons and dentists; hospitals; universities.

Selected Main Duties

General practitioners and family physicians perform some or all of the following duties:

- Examine patients, order laboratory tests, X-rays and other diagnostic procedures and consult with other medical practitioners to evaluate patients' health;
- Prescribe and administer medications and treatments;
- Perform and assist in routine surgery;
- Inoculate and vaccinate patients;
- Deliver babies and provide pre-natal and post-natal care;
- Advise patients on health care;
- Report births, deaths and contagious diseases to governmental authorities.

Working environment: Most doctors are self-employed with their incomes based on the bills they submit to the publicly funded Medicare system.

Education/Training

General practitioners and family physicians require graduation from an approved medical school and two to three-years of family practice residency training are required. Completion of qualifying examinations of the College of Family Physicians of Canada program is required and licensure by the provincial licensing authority (College of Physicians and Surgeons of Ontario) are also required.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005 due to the growing and ageing population. In addition, a substantial number of job openings will be created each year from the need to replace family physicians who retire. As well, there is a shortage of general practitioners and family physicians in rural-remote communities.

New general practitioners may be more likely to work in group medical practices and clinics than in individual practices.

Characteristics of Occupation

Estimated Employment in 2000: 12,900

	(%)
Male	71
Female	29
Full-time	91
Part-time	9
Self-employed	70
Employees	30
Working away from home	94
Working at home	3
No fixed workplace address	3

Employment by Region

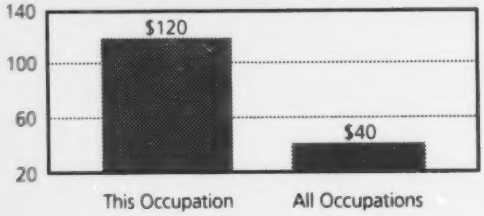
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	11	11
Toronto	49	42
London	7	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	1	3
Northeast	4	5
Northwest	2	2

Main Industries of Employment

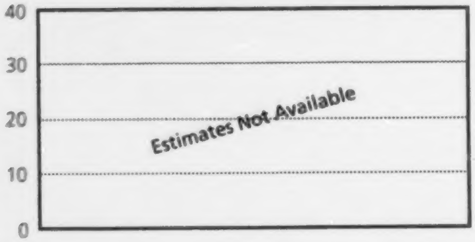
	(%)
Health and social service	96

Income and Wages

($000s) Average Annual Employment Income (1995)



($/Hour) Wage Estimates (March 1999)



For more information

College of Physicians and Surgeons of Ontario (www.cpso.on.ca)
College of Family Physicians of Canada (www.cfpc.ca)
Canadian Institute of Child Health (www.cich.ca)

3113 Dentists

Description

Dentists diagnose and treat disorders of the teeth and mouth.

Common job titles: Dentist; Endodontist; General Practice Dentist; Oral Pathologist; Oral Radiologist; Oral Surgeon; Orthodontist; Pediatric Dentist; Periodontist; Prosthodontist; Public Health Dentist.

Typical employers: offices of physicians, surgeons and dentists; non-institutional health services.

Selected Main Duties

Dentists perform some or all of the following duties:

- Examine patients' teeth, gums and surrounding tissue to diagnose disease, injury and decay and plan appropriate treatment;
- Restore and extract diseased and decayed teeth;
- Perform oral surgery, periodontal surgery and other treatments;
- Clean teeth and instruct patients on oral hygiene;
- Design bridgework, fit dentures and provide appliances to correct abnormal positioning of the teeth and jaws, or write fabrication instructions or prescriptions for use by denturists and dental technicians;
- Supervise dental hygienists, dental assistants and other staff.

Working environment: Dentist offices tend to be open four or five days a week. Solo practice is quite common with a small support staff; however, there are an increasing number of larger dental clinics opening since the 1980's. Risks of infectious diseases are present for dentists, but masks, gloves and safety glasses reduce the risks greatly.

Education/Training

One to four years of pre-dental university studies and a university degree from a recognized dental program are required. Licensure by a provincial or territorial governing body is also required. Dentists in general practice can move into a specialized practice through advanced training in areas such as oral surgery or orthodontics. Licensing for specializations is required. Certification by the National Dental Examining Board of Canada entitles dentists or graduates of approved dental programs to practise dentistry in any province in Canada provided requirements set out by the provincial and territorial licensing authorities are met. Dentists are regulated by the Province of Ontario and the Royal College of Dental Surgeons of Ontario.

Dentists may specialize in such areas as oral and maxillofacial surgery, orthodontics, pediatric dentistry, periodontics, endodontics, prosthodontics, oral pathology, oral radiology or public health dentistry.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow more rapidly than the average for all occupations through the year 2005. Many more job openings will be created each year from the need to replace workers who retire. The demand for dental services is influenced by population growth, improvements in dental hygiene and restoration technology that allows people to keep their teeth longer, expanded coverage by dental insurance plans, and public awareness of the importance of dental health.

The ageing population is likely to increase demand for restorative dental work. Better dental hygiene will increase the need for dental maintenance work.

Characteristics of Occupation

Estimated Employment in 2000: 7,300

	(%)
Male	79
Female	21
Full-time	90
Part-time	10
Self-employed	78
Employees	22
Working away from home	97
Working at home	2
No fixed workplace address	1

Employment by Region

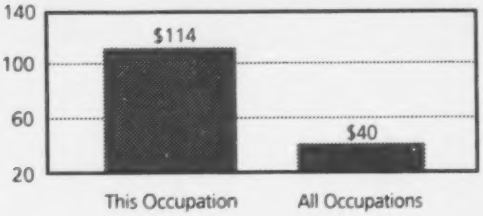
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	9	11
Toronto	55	42
London	5	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	2	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

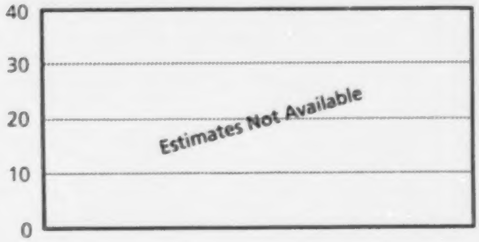
	(%)
Health and social service	99

Income and Wages

($000s) Average Annual Employment Income (1995)



($/Hour) Wage Estimates (March 1999)



For more information

Canadian Dental Association (www.cda-adc.ca)
Ontario Association of Orthodontists (www.oao.on.ca)
Ontario Dental Association (www.oda.on.ca)
Royal College of Dental Surgeons of Ontario (www.rcdso.org)

3114 Veterinarians

Description

Veterinarians prevent, diagnose and treat diseases and disorders in animals and advise clients on the feeding, hygiene, housing and general care of animals. Veterinarians work in private practice or may be employed by animal clinics and laboratories, government or industry.

Common job titles: Small Animal Veterinary Specialist; Veterinarian; Veterinary Inspector; Veterinary Pathologist; Veterinary Physiologist; Zoo Veterinarian.

Typical employers: federal and provincial governments; universities; animal hospitals and clinics; laboratories; private practices.

Selected Main Duties

Veterinarians perform some or all of the following duties:

- Diagnose diseases or abnormal conditions in animals through physical examinations or laboratory tests;
- Treat sick or injured animals by prescribing medication, setting bones, dressing wounds or performing surgery;
- Inoculate animals to prevent diseases;
- Advise clients on feeding, housing, breeding, hygiene and general care of animals;
- Supervise animal health technologists and animal care workers;
- Have responsibilities for overall operation of animal hospital, clinic or mobile service to farms;
- Conduct veterinary research;
- Enforce government regulations in disease control and food production including animal or animal-based food inspection.

Working environment: The working conditions for veterinarians are generally noisy animal hospitals or clinics. Others drive great distances to investigate sick farm animals. Exposure to disease and physical harm from scratching or biting is a constant risk to members of this occupational group.

Education/Training

Two to four years of pre-veterinary university studies and a four-year university degree in veterinary medicine is required. Entry into research positions may require post-graduate study. All students in Canada must write a National Examining Board exam. Successful candidates are granted a Certificate of Qualification, a pre-requisite for licensure in most provinces. It is mandatory to be licensed with the College of Veterinarians of Ontario to practice and use the title of "Veterinarian" in Ontario. The College is the licensing and regulatory body in Ontario.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to increase more slowly than the average for all occupations through the year 2005. Most job openings will result from the need to replace veterinarians who retire.

Demand for veterinary services is becoming increasingly complex as a result of biotechnology and advances in animal reproductive science. Changes in agriculture due to the changing requirements of world and domestic markets, environmental concerns and trends to ownership of traditional and non-traditional pets will all affect the work of veterinarians.

Characteristics of Occupation

Estimated Employment in 2000: 1,900

	(%)
Male	57
Female	43
Full-time	88
Part-time	12
Self-employed	56
Employees	44
Working away from home	85
Working at home	8
No fixed workplace address	7

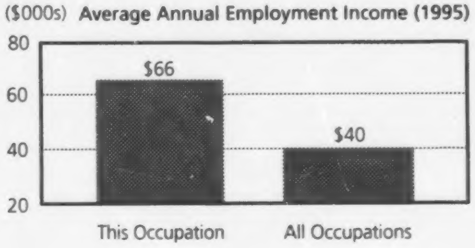
Employment by Region

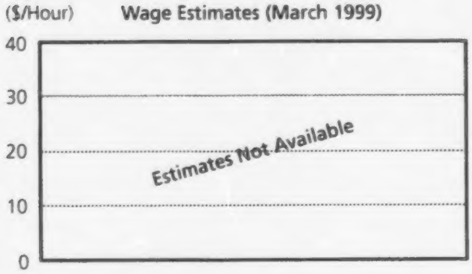
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	5	4
Muskoka-Kawarthas	6	3
Kitchener-Waterloo-Barrie	18	9
Hamilton-Niagara Peninsula	11	11
Toronto	29	42
London	6	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	6	3
Northeast	3	5
Northwest	2	2

Main Industries of Employment

	(%)
Agricultural and related service	91

Income and Wages





For more information

Canadian Veterinary Medical Association (www.cvma-acmv.org)
College of Veterinarians of Ontario (www.cvo.org)
Ontario Veterinary Medical Association (www.ovma.org)

3121 Optometrists

Description

Optometrists examine eyes, prescribe and fit eyeglasses and contact lenses and recommend treatments to correct vision problems or ocular disorders.

Common job titles: Doctor of Optometry (OD); Optometrist.

Typical employers: offices of health practitioners; offices of physicians, surgeons and dentists.

Selected Main Duties

Optometrists perform some or all of the following duties:

- Examine patients' eyes, conduct tests and use ophthalmoscopes, biomicroscopes and other specialized instruments to determine visual efficiency;
- Prescribe treatment (excluding surgery) to conserve, improve and correct vision and other ocular disorders;
- Prescribe and fit eyeglasses and contact lenses, counsel patients on contact lens use and care, visual hygiene, lighting arrangements, working distances and safety factors;
- Refer patients to ophthalmologists or other physicians and surgeons when ocular or other diseases are found.

Working environment: Optometrists work in well-lighted, clean offices. Many work Saturdays and evenings to suit the needs of patients.

Education/Training

One to three years of college or university, with a concentration in mathematics and science courses and a four-year university program in optometry are required. Licensure by the provincial or territorial governing body is required. Optometrists are governed by the Province of Ontario and the Council of the College of Optometrists of Ontario.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow more rapidly than the average for all occupations through the year 2005. As the baby boom ages, the percentage of the population needing the services of optometrists will increase. As well, insurance coverage that includes an eyewear allowance also affects demand.

The rapid development of new diagnosing and treating technologies means that people in these occupations must continually update their skills.

Characteristics of Occupation

Estimated Employment in 2000: 1,600

	(%)
Male	58
Female	42
Full-time	88
Part-time	12
Self-employed	73
Employees	27
Working away from home	94
Working at home	2
No fixed workplace address	4

Employment by Region

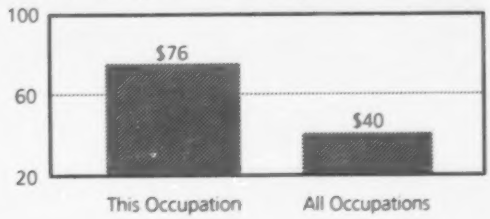
	(%) This Occupation	*(%) All Occupations*
Ottawa	12	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	11	11
Toronto	37	42
London	9	5
Windsor-Sarnia	7	5
Stratford-Bruce Peninsula	2	3
Northeast	5	5
Northwest	2	2

Main Industries of Employment

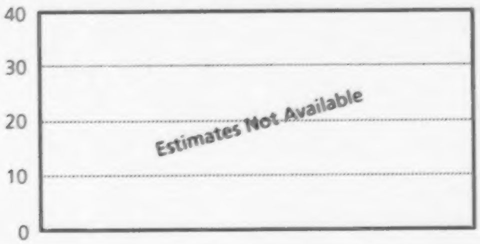
	(%)
Health and social service	93
Retail trade	5

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Canadian Association of Optometrists (www.opto.ca)

School of Optometry, University of Waterloo (www.optometry.uwaterloo.ca)

3122 Chiropractors

Description

Chiropractors diagnose and treat patients' disorders of the spine and other body joints by adjusting the spinal column or through other corrective manipulation.

Common job titles: Chiropractor; Chiropractic Doctor; Doctor of Chiropractic (D.C.).

Typical employers: offices of health practitioners; offices of physicians, surgeons and dentists.

Selected Main Duties

Chiropractors perform some or all of the following duties:

- Take patient's case history, conduct examination, observe patient and perform or order x-rays and other tests to diagnose patient's condition;
- Diagnose disorders of the spine and other body joints;
- Treat patients whose symptoms result from abnormal musculoskeletal conditions or joint mechanics through the corrective manipulation of the spinal column or other joints and use additional treatments such as heat, light and massage;
- Advise patients on corrective exercises, lifestyle and nutrition.

Working environment: Chiropractors work in offices that are clean and comfortable. The use of radiation requires that chiropractors take precautions against the repeated exposure to radiation.

Education/Training

Two years of university undergraduate studies in sciences and completion of a four-year program at an accredited chiropractic college and completion of the examinations of the Canadian Chiropractic Examining Board and of the provincial licensing body are required. The College of Chiropractors of Ontario is the governing body established by the provincial government to regulate chiropractors in Ontario. Every chiropractor practising in Ontario must be a registered member of the College.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005 due to the increasing demand for alternative forms of medical treatment. The growing older population, with their increased likelihood of mechanical and structural problems, will also increase demand.

Since many chiropractors work outside of the provincial health care plans, they should be less affected by government's restructuring of the health care sector. The rapid development of new diagnosing and treating technologies means that people in this occupation must continually update their skills.

Characteristics of Occupation

Estimated Employment in 2000: 2,400

	(%)
Male	75
Female	25
Full-time	90
Part-time	10
Self-employed	77
Employees	23
Working away from home	92
Working at home	7
No fixed workplace address	1

Employment by Region

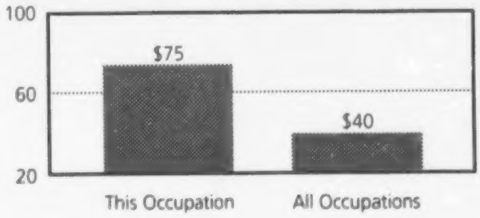
	(%) This Occupation	*(%) All Occupations*
Ottawa	8	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	18	9
Hamilton-Niagara Peninsula	10	11
Toronto	40	42
London	4	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	4	3
Northeast	7	5
Northwest	2	2

Main Industries of Employment

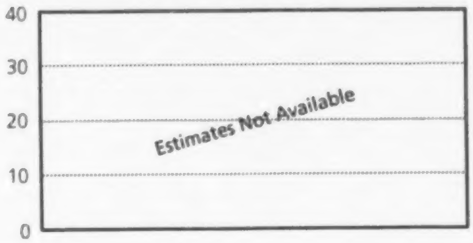
	(%)
Health and social service	98

Income and Wages

($000s) Average Annual Employment Income (1995)



($/Hour) Wage Estimates (March 1999)



For more information

Canadian Chiropractic Association (www.ccachiro.org)
College of Chiropractors of Ontario (www.cco.on.ca)
Ontario Chiropractic Association (www.chiropractic.on.ca)

3131 Pharmacists

Description

Retail pharmacists and hospital pharmacists compound and dispense prescribed pharmaceuticals. Industrial pharmacists participate in the research, development and manufacture of pharmaceutical products.

Common job titles: Clinical Pharmacist; Community Pharmacist; Druggist; Hospital Pharmacist; Industrial Pharmacist; Pharmacist; Retail Pharmacist.

Typical employers: prescription drugs stores; hospitals; pharmaceutical firms.

Selected Main Duties

Retail pharmacists and *hospital pharmacists* may perform some or all of the following duties:

- Check prescriptions for proper dosage;
- Compound prescribed pharmaceutical products by calculating, measuring and mixing the quantities of drugs and other ingredients required and filling appropriate containers with correct quantity;
- Dispense prescribed pharmaceuticals to customers or to other health care professionals and advise them on the administration, uses and effects of the medication, drug incompatibilities and contra-indications;
- Maintain medication profiles of customers including registry of poisons and narcotic and controlled drugs;
- Ensure proper storage of vaccines, serums, biological and other pharmaceutical products to prevent deterioration;
- Advise customers on selection and use of non-prescription medication.

Industrial pharmacists perform some or all of the following duties:

- Participate in basic research work for the development of new drugs;
- Formulate new drug products developed by medical researchers;
- Test new drug products for stability and to determine their absorption and elimination patterns;
- Co-ordinate clinical investigations of new drugs;
- Control the quality of drug products during production;
- Develop informational materials concerning the uses and properties of particular drugs.

Working environment: Pharmacists generally work in a clean, well-lighted, well-ventilated area in a pharmacy or a laboratory. Gloves and masks are often required when dealing with potentially dangerous substances. Pharmacists working alone have long working hours without breaks. Evenings, weekends and holidays are considered normal working times for a pharmacist as patients may require medication at any time, as well as to accommodate client shopping needs.

Education/Training

A Bachelor of Science degree in pharmacy is required. Community and hospital pharmacists also require practical training under the supervision of a pharmacist. Licensure is required in all provinces. Forty-eight weeks of in-service training is required of all candidates for licensure. A qualifying examination is also administered. Experience as a pharmacist is usually required for managers of pharmacies or of pharmacy departments. In Ontario, pharmacists are regulated by the Province of Ontario and the Council of the Ontario College of Pharmacists.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Job seekers with the appropriate skills and qualifications can expect good job prospects, as employers across Ontario report difficulties in finding qualified workers to fill vacant positions.

Employment of pharmacists will be influenced by an ageing population that will increase the demand for prescription drugs and restructuring of pharmacy operations in hospitals. Mail order pharmacies, discount chains and substitution of pharmaceutical assistants for pharmacists are other trends that will play a role.

The rapid development of new drugs for treatment and diagnosis means that pharmacists must update their knowledge continuously. Use of computerized customer and pharmaceutical databases will require pharmacists to develop appropriate skills.

Characteristics of Occupation

Estimated Employment in 2000: 8,300

	(%)
Male	44
Female	56
Full-time	81
Part-time	19
Self-employed	2
Employees	98
Working away from home	96
Working at home	1
No fixed workplace address	3

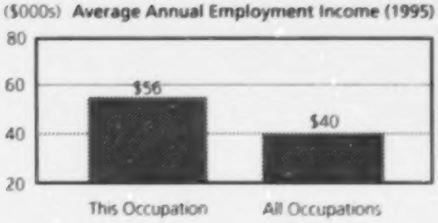
Employment by Region

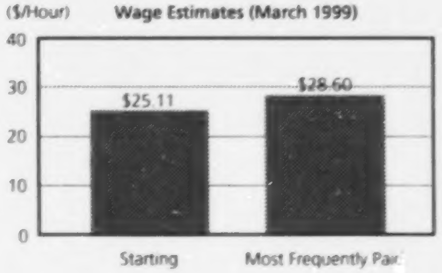
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	8	11
Toronto	50	42
London	6	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	2	3
Northeast	5	5
Northwest	2	2

Main Industries of Employment

	(%)
Retail trade	79
Health and social service	18

Income and Wages





For more information

Canadian Pharmacists Association (www.cdnpharm.ca)
Ontario College of Pharmacists (www.ocpharma.com)
Ontario Pharmacists' Association (www.ontpharmacists.on.ca)

3141 Audiologists and Speech-Language Pathologists

Description

Audiologists diagnose, evaluate and treat hearing disorders. Speech-language pathologists diagnose, evaluate and treat speech, language and voice disorders.

Common job titles: Audiologist; Certified Audiologist; Clinical Audiologist; Clinical Pathologist – Speech-Language; Educational Audiologist; Language Pathologist; Research Audiologist; Research Pathologist, Speech-Language; Speech and Hearing Clinician; Speech-Language Pathologist; Speech Therapist.

Typical employers: hospitals; elementary and secondary schools; non-institutional health services; non-institutional social services; offices of physicians, surgeons and dentists; health and social service associations and agencies.

Selected Main Duties

Audiologists perform some or all of the following duties:

- Administer audiometric tests to diagnose and evaluate the degree and type of hearing impairment;
- Plan and implement rehabilitation programs for patients, including selection and fitting of hearing aids, speech (lip) reading and counselling;
- Consult with physicians, nurses, psychologists and other health care personnel to help plan treatment programs;
- Conduct research related to hearing;
- Instruct audiology students and other health care personnel in audiology.

Speech-language pathologists perform some or all of the following duties:

- Administer tests and observe patients to diagnose and evaluate speech, language and voice disorders;
- Plan and implement remedial programs to correct speech, language and voice disorders;
- Consult with physicians, nurses, psychologists and other health care personnel to help plan treatment programs;
- Conduct research on speech and other communication disorders and on the development and design of diagnostic procedures and devices.

Working environment: Audiologists and speech-language pathologists spend most of their time at their desk in a well-lighted, well-ventilated, clean area. The physical demands are light. Speech-language pathologists and audiologists working on a contract basis may travel extensively between facilities.

Education/Training

Audiologists and speech-language pathologists require a bachelor's degree in communication disorders, psychology, linguistics or a related field. Audiologists require a master's degree in audiology. Speech-language pathologists usually require a master's degree in speech-language pathology. Certification with the Canadian Association of Speech-Language Pathologists and Audiologists may be required. Some of those working in the school system require a teaching certificate. In Ontario, audiologists and speech language pathologists are regulated by the College of Audiologists and Speech-Language Pathologists of Ontario.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through 2005. Growth in elderly population will result in increased numbers of older people with hearing loss requiring audiology services. However, fiscal constraint in the public sector could lead to fewer employment opportunities in the publicly funded health care and educational systems. Private practice is likely to offer the best opportunities at this time.

Characteristics of Occupation

Estimated Employment in 2000: 2,400

	(%)
Male	8
Female	92
Full-time	75
Part-time	25
Self-employed	12
Employees	88
Working away from home	86
Working at home	4
No fixed workplace address	10

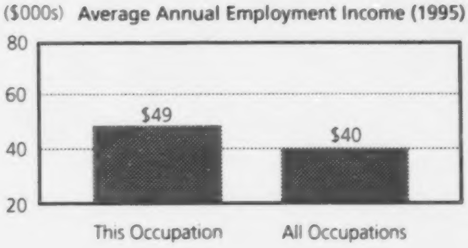
Employment by Region

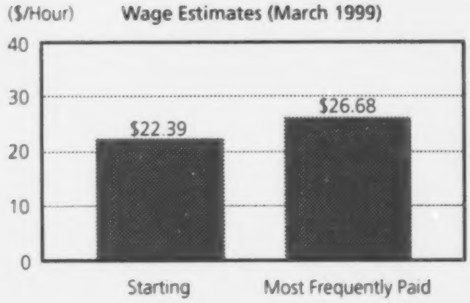
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	11	11
Toronto	44	42
London	9	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	1	3
Northeast	6	5
Northwest	1	2

Main Industries of Employment

	(%)
Health and social service	71
Educational service	26

Income and Wages





For more information

Ontario Association of Speech-Language Pathologists and Audiologists (www.osla.on.ca)
Canadian Association of Speech-Language Pathologists and Audiologists (www.caslpa.ca)
College of Audiologists and Speech-Language Pathologists of Ontario (www.caslpo.com)

3142 Physiotherapists

Description

Physiotherapists plan and carry out individually designed programs of physical treatment to maintain, improve or restore physical functioning, alleviate pain and prevent physical dysfunctioning in patients. Physiotherapists may focus their practice in particular clinical areas such as neurology, oncology, rheumatology, orthopaedics, obstetrics, paediatrics, geriatrics or in the treatment of patients with cardiovascular and cardiopulmonary disorders, burns or sports injuries.

Common job titles: Physical Therapist; Physiotherapist; Registered Physiotherapist; Research Physiotherapist.

Typical employers: hospitals; offices of health practitioners; non-institutional health services; non-institutional social services; offices of physicians, surgeons and dentists; institutional health and social services firms.

Selected Main Duties

Physiotherapists perform some or all of the following duties:

- Assess patients' physical abilities through evaluative procedures such as functional ability tests;
- Treat injuries, illnesses (like strokes), and disabilities that affect movement;
- Plan programs of physiotherapy;
- Implement these programs, which may include therapeutic exercise, manipulations, massage, education, the use of electro-therapeutic and other mechanical equipment, ultrasound, muscle stimulation, laser and hydro-therapy;
- Maintain clinical and statistical records and confer with other health care professionals;
- Develop and implement health promotion programs for patients, staff and the community;
- Conduct research in physiotherapy;
- Act as a physiotherapy consultant or educator.

Working environment: The nature of physical therapists work requires a specially equipped area in a hospital, clinic or therapist's office. A 40-hour workweek is common. The physical demands are significant as it is often necessary to kneel, lift or stand for extended periods of time, as well as move heavy pieces of equipment.

Education/Training

A university degree in physiotherapy and a period of supervised practical training are required. Entrance requirements vary from university to university. Physiotherapy National Examination (P.N.E.) is required for licensing. In Ontario, to use the title of "Registered Physiotherapist" and practice as a physiotherapist in the province, individuals must be registered with the College of Physiotherapists of Ontario.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Job seekers with the appropriate skills and qualifications can expect good employment opportunities, as employers across Ontario report difficulties in finding qualified workers to fill vacant positions. The demand for physiotherapists is related to the ageing population and increased attention to the needs of disabled persons and accident victims.

Characteristics of Occupation

Estimated Employment in 2000: 4,200

	(%)
Male	17
Female	83
Full-time	72
Part-time	28
Self-employed	18
Employees	82
Working away from home	91
Working at home	3
No fixed workplace address	6

Employment by Region

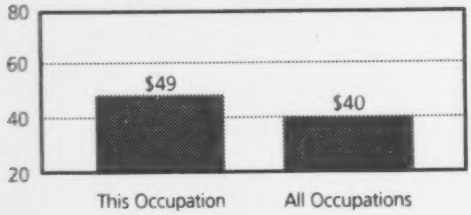
	(%) This Occupation	*(%) All Occupations*
Ottawa	13	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	13	11
Toronto	44	42
London	5	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	2	3
Northeast	4	5
Northwest	3	2

Main Industries of Employment

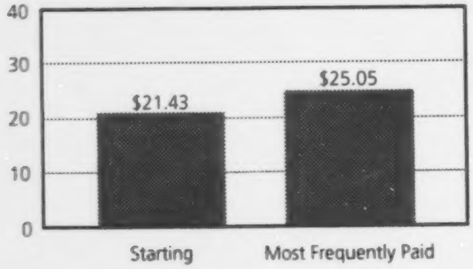
	(%)
Health and social service	98

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Ontario Physiotherapy Association (www.opa.on.ca)
Canadian Physiotherapy Association (www.physiotherapy.ca)
Canadian Athletic Therapists Association (www.mtroyal.ab.ca/CATA)
College of Physiotherapists of Ontario (www.collegept.org)

3143 Occupational Therapists

Description

Occupational therapists plan and carry out individually designed programs of educational, vocational and recreational activity for patients with physical or mental health problems to enhance their ability to care for themselves and to engage in work and recreational pursuits. They may specialize in working with a specific age group, such as children or the elderly, or with clients who have a specific disability such as arthritis or schizophrenia.

Common job titles: Clinical Occupational Therapy Specialist; Community Occupational Therapist; Occupational Therapist; Research Occupational Therapist.

Typical employers: hospitals; non-institutional health services; offices of health practitioners; non-institutional social services; municipal governments; health and social service associations and agencies.

Selected Main Duties

Occupational therapists perform some or all of the following duties:

- Observe patients and consult physicians' prognoses to assess patients' emotional and physical capacities;
- Develop treatment programs, which may include manual and creative arts, industrial and vocational skills and recreational activities;
- Implement treatment programs and evaluate their progress;
- Maintain clinical and statistical records;
- Advise on health risks in the workplace or participate in other programs, such as pre-retirement programs, to prevent physical or mental health problems;
- Conduct research in occupational therapy;
- Act as an occupational therapy consultant or educator.

Working environment: Occupational therapists who work in schools, work a typical school day; those in hospitals and other health care settings, generally work a 40-hour week.

Education/Training

A university degree in occupational therapy or rehabilitation, including a period of supervised practical training and completion of the national certification examination are required. Licensure or registration by the Province of Ontario and the College of Occupational Therapists is required.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005 due to the rising elderly population and increased attention to the needs of disabled persons and accident victims.

Job growth in this field has been influenced by increasing acceptance of rehabilitation as a practical alternative to long-term care in institutions. Job growth is likely to be restrained in publicly funded health care settings due to the increased use of rehabilitation aides and constrained health care budgets. On the other hand, some growth in this occupation is occurring in private practices outside of the institutional health care setting.

Characteristics of Occupation

Estimated Employment in 2000: 3,000

	(%)
Male	8
Female	92
Full-time	74
Part-time	26
Self-employed	11
Employees	89
Working away from home	88
Working at home	6
No fixed workplace address	6

Employment by Region

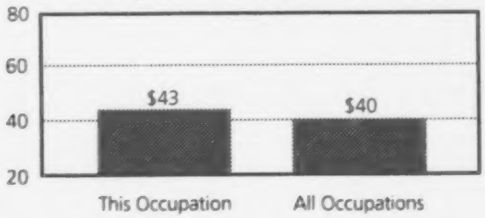
	(%) This Occupation	*(%) All Occupations*
Ottawa	5	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	15	11
Toronto	40	42
London	8	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	3	3
Northeast	6	5
Northwest	5	2

Main Industries of Employment

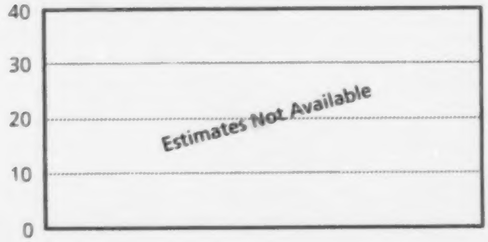
	(%)
Health and social service	97

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

College of Occupational Therapists of Ontario (www.coto.org)
Canadian Centre for Occupational Health and Safety (www.ccohs.ca)
Canadian Association of Occupational Therapists (www.caot.ca)

3152 Registered Nurses

Description

Registered nurses provide direct nursing care to patients, deliver health education programs and provide consultative services regarding issues relevant to the practice of nursing. Registered nurses may specialize in areas such as surgery, obstetrics care, psychiatric care, critical care, pediatrics, geriatrics, community health, occupational health, emergency care, rehabilitation or oncology.

Common job titles: Community Health Nurse; Critical Care Nurse; Graduate Nurse; Nurse Clinician; Nursing Consultant; Nursing Researcher; Occupational Health Nurse; Private Duty Nurse; Public Health Nurse; Registered Nurse (RN); Registered Psychiatric Nurse.

Typical employers: hospitals; surgeons and dentists offices; non-institutional health services; medical laboratories; offices of health practitioners.

Selected Main Duties

General duty registered nurses perform some or all of the following duties:

- Consult with other members of the health care team to assess, plan, implement and evaluate patient care;
- Administer medications and treatments as prescribed by a physician;
- Monitor, record and report symptoms and changes in patients' conditions;
- Operate or monitor medical apparatus or equipment;
- Assist in surgery and other medical procedures;
- Supervise registered nursing assistants and other nursing staff.

Occupational health nurses develop and implement employee health education programs and provide registered nursing care in private businesses and industry.

Public health nurses provide health education and registered nursing care in public health units and through home visits.

Psychiatric nurses provide nursing care, supportive counselling and life skills programming to patients in psychiatric hospitals and mental health clinics.

Nurse practitioners provide broader generalist services in prevention and treatment complementing those provided by family physicians and other primary health care professionals. They generally work as part of multidisciplinary teams but may work alone in rural and remote areas.

Working environment: Nurses often experience prolonged periods of standing and walking. Shift work and weekend work are possible. The shifts may be twelve hours in length and are usually split between day and night. Nursing has its hazards due to contact with contagious and infectious diseases, or potentially hazardous chemicals, anaesthetics and radiation.

Education/Training

Completion of a university, college or other approved registered nursing program is required. Licensure by the provincial licensing authority is required. Licensing is achieved by passing the Canadian Nursing Examination and registration with the College of Nurses of Ontario. Starting January 1, 2005, all new Ontario nurses will have a four-year baccalaureate degree in Nursing (BScN). Additional academic training or experience is required to specialize in a specific area of nursing or to become a nurse practitioner. A master's or doctorate degree in nursing is usually required for clinical nurse specialists, nurse clinicians, nursing consultants and nursing researchers.

Employment Prospects

Over the next five years: Strong

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. Many more job openings will be created each year from the need to replace workers who retire.

Nurses' roles will change as new technology continues to be introduced at the bedside and as nurses are allowed to perform procedures previously restricted to physicians. Ontario requirements for the registered nurse (RN) designation have recently been increased to the university level. Restructuring of the health care system, including the potential shift from institutional to home care, will also change the requirements for nurses.

Nurses are encouraged to consider taking on additional qualifications as nurse practitioners. Nurse practitioners are registered nurses who have additional education, allowing them to provide generalist services in health promotion, prevention and treatment of disease and injury, rehabilitation and support.

Characteristics of Occupation

Estimated Employment in 2000: 70,800

	(%)
Male	4
Female	96
Full-time	61
Part-time	39
Self-employed	1
Employees	99
Working away from home	96
Working at home	0
No fixed workplace address	4

Employment by Region

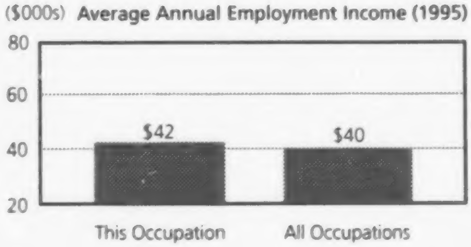
	(%) This Occupation	*(%) All Occupations*
Ottawa	12	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	14	11
Toronto	33	42
London	7	5
Windsor-Sarnia	7	5
Stratford-Bruce Peninsula	3	3
Northeast	6	5
Northwest	3	2

Main Industries of Employment

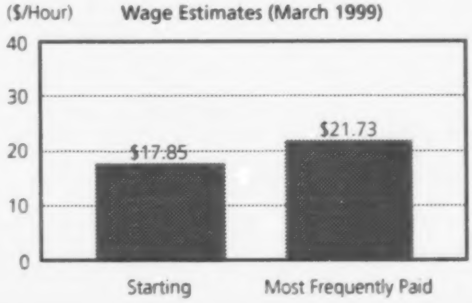
	(%)
Health and social service	96

Income and Wages

Average Annual Employment Income (1995)



Wage Estimates (March 1999)



For more information

College of Nurses of Ontario (www.cno.org)
Registered Nurses Association of Ontario (www.rnao.org)
Canadian Nurses Association (www.cna-nurses.ca)

3211 Medical Laboratory Technologists and Pathologists' Assistants

Description

Medical laboratory technologists conduct medical laboratory tests, experiments and analyses to assist in the diagnosis, treatment and prevention of disease. Pathologists' assistants assist in autopsies and examinations of surgical specimens or perform autopsies under a pathologist's supervision.

Common job titles: Autopsy Technician; Clinical Immunology Technologist; Cytotechnologist; Histology Technologist; Immunohematology Technologist; Medical Laboratory Technologist; Pathologist's Assistant.

Typical employers: hospitals; medical laboratories; provincial government; clinics; universities.

Selected Main Duties

Medical Laboratory Technologists may specialize in areas such as clinical chemistry, clinical microbiology, hematology, histotechnology, immunohematology and cytotechnology. They perform some or all of the following duties:

- Conduct chemical analyses of blood, urine, cerebro-spinal and other body fluids;
- Study blood cells and other tissue to determine their relation to various physiological and pathological conditions;
- Prepare tissue sections for microscopic examinations using techniques to demonstrate special cellular tissue elements or other characteristics;
- Establish procedures for the analysis of specimens and for medical laboratory experiments;
- Perform blood group, type and compatibility tests for transfusion purposes;
- Supervise and train other medical laboratory technologists and other medical laboratory workers.

Pathologists' assistants perform some or all of the following duties:

- Prepare for autopsies by obtaining patients' medical records and arranging for radiographic examinations;
- Assist with or perform autopsies and surgical specimen examinations under pathologists' supervision;
- Dissect, examine, weigh and photograph organs and specimens, collect tissue specimens for chemical analysis and record findings;
- Prepare bodies for release to funeral homes following completion of autopsies;
- Clean and maintain autopsy, surgical and other equipment;
- Train junior resident pathologists and train and supervise morgue attendants.

Working environment: In large hospitals, personnel usually work the day, evening or night shift. Proper methods of control and sterilization are necessary to prevent hazardous contact with harmful chemicals. Weekends and holidays are also important. Laboratory personnel in smaller facilities are also likely to work on rotating shifts.

Education/Training

Medical laboratory technologists require a Bachelor of Science or medical laboratory science degree or a two or three-year college program in medical laboratory technology and a period of supervised practical training. Certification by the Canadian Society for Medical Laboratory Science is available for medical laboratory technologists and is usually required by employers.

Pathologists' assistants require a Bachelor of Science degree or training, experience as a registered nurse, registered nursing assistant or medical laboratory technologist, and specialized on-the-job training.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005 as the volume of laboratory tests increases with population growth and the development of new types of tests. In addition, many job openings will result from the need to replace workers who retire.

New, more powerful diagnostic techniques such as DNA testing, will increase the demand for medical technologists. However, automation of diagnostic and treatment procedures may have an offsetting effect. In addition, the preparation of specimens in high technology laboratories is increasingly being done with computerized systems and robotics, which can reduce the demand for laboratory technologists. The rapid development of new medical technologies means that medical technologists must continually update their skills.

Characteristics of Occupation

Estimated Employment in 2000: 5,000

	(%)
Male	22
Female	78
Full-time	80
Part-time	20
Self-employed	0
Employees	100
Working away from home	99
Working at home	0
No fixed workplace address	1

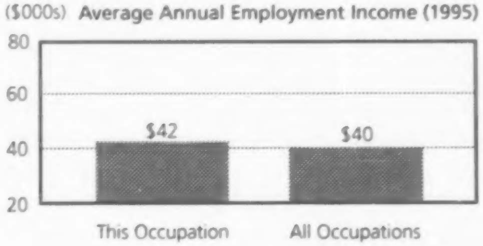
Employment by Region

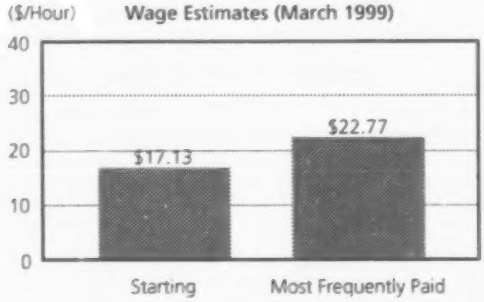
	(%) This Occupation	*(%) All Occupations*
Ottawa	5	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	12	11
Toronto	46	42
London	9	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	2	3
Northeast	5	5
Northwest	3	2

Main Industries of Employment

	(%)
Health and social service	90

Income and Wages





For more information

College of Medical Laboratory Technologists of Ontario (www.cmlto.com)
Ontario Society of Medical Technologists (www.osmt.org)
Canadian Society for Medical Laboratory Science (www.csmls.org)

3212 Medical Laboratory Technicians

Description

Medical laboratory technicians conduct routine medical laboratory tests and set up, clean and maintain medical laboratory equipment.

Common job titles: Medical Laboratory Assistant; Medical Laboratory Technician.

Typical employers: hospitals; medical laboratories; universities; offices of physicians, surgeons and dentists; federal and provincial governments.

Selected Main Duties

Medical laboratory technicians perform some or all of the following duties:

- Collect blood, tissue or other samples from patients;
- Log patient samples and prepare them for testing;
- Set up medical laboratory equipment;
- Conduct routine laboratory tests and sample analyses;
- Clean and maintain the medical laboratory and medical laboratory equipment.

Working environment: In large hospitals that operate continuously, personnel usually work the day, evening or night shift. Laboratory personnel in smaller facilities are also likely to work on rotating shifts rather than on a regular shift. Weekends and holidays are also important. Proper methods of control and sterilization are necessary to prevent hazardous contact with harmful chemicals.

Education/Training

Completion of secondary school and on-the-job training or a one to two-year college program in medical technology is required.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. While there have been major breakthroughs in diagnostic techniques over the past several decades, restructuring of health care services will affect the employment prospects for this occupation. The increased use of portable laboratory instruments and testing kits, combined with the growth of shared laboratory services among health care providers, will also affect the work for this occupation.

Characteristics of Occupation

Estimated Employment in 2000: 9,400

	(%)
Male	20
Female	80
Full-time	76
Part-time	24
Self-employed	0
Employees	100
Working away from home	98
Working at home	0
No fixed workplace address	2

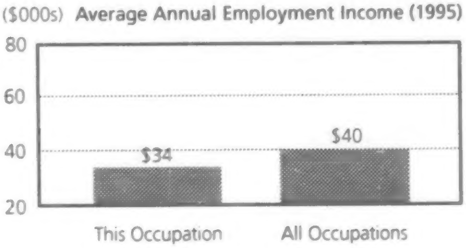
Employment by Region

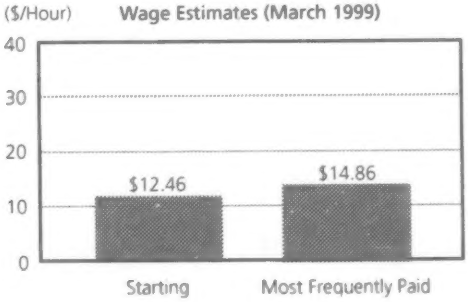
	(%) This Occupation	*(%) All Occupations*
Ottawa	14	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	11	11
Toronto	48	42
London	6	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	1	3
Northeast	5	5
Northwest	1	2

Main Industries of Employment

	(%)
Health and social service	86

Income and Wages





For more information

Ontario Society of Medical Technologists (www.osmt.org)

3214 Respiratory Therapists and Clinical Perfusionists

Description

Respiratory therapists assist physicians in the diagnosis, treatment and care of patients with cardiorespiratory problems due to stroke, heart attack, head injury, emphysema, asthma or shock. Clinical perfusionists provide technical support to cardiac surgeons and anaesthetists during open-heart surgery.

Common job titles: Cardiovascular Perfusion Supervisor; Cardiovascular Perfusionist; Certified Clinical Perfusionist; Chief Perfusionist; Chief Respiratory Technologist; Clinical Instructor – Cardiovascular Perfusion; Respiratory Therapy Clinical Instructor; Perfusionist; Registered Respiratory Therapist; Respiratory Technologist; Respiratory Therapist.

Typical employers: hospitals; non-institutional health services; offices of physicians, surgeons and dentists.

Selected Main Duties

Respiratory therapists may specialize in areas such as anesthesia, critical care, pediatrics, cardiopulmonary diagnostics and respiratory home care. They perform some or all of the following duties:

- Perform diagnostic tests, such as arterial blood-gas analysis and cardiopulmonary functions tests;
- Operate and monitor respiratory equipment to administer treatments such as oxygen, oxygen-air mixtures, humidified air or medications;
- Perform artificial respiration and external cardiac massage;
- Maintain and test diagnostic and therapeutic equipment;
- Supervise and train student respiratory therapists and other respiratory therapists;
- Participate in research related to cardiac and pulmonary disorders.

Clinical perfusionists perform some or all of the following duties:

- Assemble, maintain and operate extra corporeal circulation equipment, intra-aortic balloon pumps and other heart assist devices to support or temporarily replace patients' cardiopulmonary functions during open-heart surgery;
- Administer blood products, drugs and other substances through heart-lung machines and other devices as directed by cardiac surgeons and anesthetists;
- Monitor vital signs to maintain patients' physiological functions during cardiopulmonary surgery;
- Supervise and train student clinical perfusionists and other clinical perfusionists.

Working environment: Respiratory therapists usually work a 40-hour workweek. Since hospitals work around the clock, therapists may work nights, evenings or weekends. Proper safety precautions reduce the risk posed by compressed gases and the dangers of infectious diseases present in blood samples and syringes.

Education/Training

Respiratory therapists require the completion of a two to three-year college or hospital program in respiratory therapy, including clinical training. Clinical perfusionists require the completion of a respiratory therapy or registered nursing program with a minimum of one year of work experience as a respiratory therapist or registered nurse and completion of a one-year college program in clinical perfusion, including clinical training. In Ontario, the College of Respiratory Therapists of Ontario regulate the profession in the public interest.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. The potential increase in cardiopulmonary diseases due to an ageing population and technological advances in treatment will increase the demand for respiratory therapists. Since most workers in this occupation are employed in hospitals, the restructuring of the health care sector may limit opportunities for this occupation in the short term.

Characteristics of Occupation

Estimated Employment in 2000: 2,000

	(%)
Male	40
Female	60
Full-time	84
Part-time	16
Self-employed	7
Employees	93
Working away from home	97
Working at home	1
No fixed workplace address	2

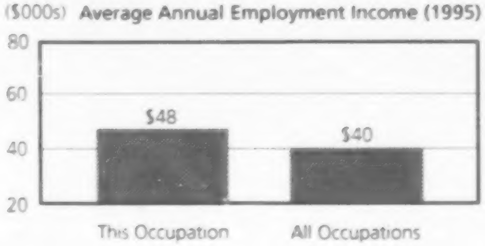
Employment by Region

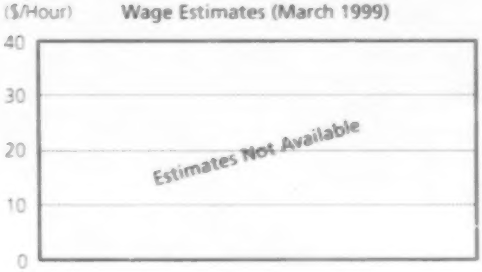
	(%) This Occupation	*(%) All Occupations*
Ottawa	11	10
Kingston-Pembroke	6	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	11	9
Hamilton-Niagara Peninsula	10	11
Toronto	35	42
London	12	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	2	3
Northeast	6	5
Northwest	2	2

Main Industries of Employment

	(%)
Health and social service	92

Income and Wages





For more information

Respiratory Therapy Society of Ontario (www.rtso.org)
Canadian Society of Respiratory Therapists (www.csrt.com)
College of Respiratory Therapists of Ontario (www.crto.on.ca)

3215 Medical Radiation Technologists

Description

Technologists include the following three groups: radiography technologists, radiation therapists and nuclear medicine technologists. They operate radiographic and radiation therapy equipment to administer radiation treatment and produce images of body structures for the diagnosis and treatment of injury and disease.

Common job titles: Clinical Instructor – Radiation Therapy; Mammography Technician; Nuclear Medicine Technologist; Radiation Therapist; Radiation Therapy Technologist; Radiography Technologist; Radiotherapy Technician; X-Ray Technician.

Typical employers: hospitals; medical laboratories; offices of physicians, surgeons, dentists; cancer treatment centres; clinics.

Selected Main Duties

Common duties, which the three groups may perform, include recording and processing results and procedures, checking equipment to ensure proper operation and training and supervising student technologists.

For *radiography technologists*, the main duties involve:

- Operating X-ray, radiographic and fluoroscopic equipment, specialized C.T. scanners and mammography units to produce radiographs or images of body structures for the diagnosis of disease or injury by radiologists.

For *nuclear medicine technologists*, the main duties involve:

- Preparing radio pharmaceuticals, such as radio nuclides and other materials and administer them to patients or to biological samples;
- Operating radiation detection equipment, such as gamma cameras, scanners, scintillation counters and ionization chambers, to acquire data for use by nuclear medicine physicians in the diagnosis of disease;
- Performing diagnostic procedures using radioactive materials on biological specimens, such as blood, urine and faeces.

For *radiation therapists*, the main duties involve:

- Operating linear accelerators, cobalt 60, X-ray and other radiation therapy equipment to administer radiation treatment prescribed by radiation oncologists;
- Assisting radiation oncologists and clinical physicists with the preparation of radiation treatment plan;
- Assisting in the preparation of sealed radioactive materials such as cobalt, radium, cesium and isotopes and the construction of devices such as plaster casts and acrylic moulds to assist with administering of radiation treatment;
- Working together with physicians and physicists to administer the prescribed course of treatment and educate the patient on how to cope with side effects.

Working environment: A 40-hour workweek is common including evening and weekend work. Physical stamina is also important when lifting patients and standing for long periods of time. The use of shields and other protective devices reduces the risk of radiation.

Education/Training

There are several different specialties in this occupational group, each having different regulatory requirements. Completion of a two to three-year college, hospital school or other approved program in diagnostic radiography (for radiography technologists), nuclear medicine technology (for nuclear medicine technologists) or radiation therapy (for radiation therapists) and a period of supervised practical training are required.

In Ontario, medical radiation technologists are regulated by the College of Medical Radiation Technologists of Ontario. They must complete the examination set by the Canadian Association of Medical Radiation Technologists. To practice as a medical radiation technologist in radiography, nuclear medicine or radiation therapy in the province, they must be registered with the College of Medical Radiation Technologists of Ontario.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. Increases in illnesses associated with an ageing population should increase the demand for workers in this occupation. However, overall demand for these technologists depends on the extent of government funding for new technologies and cancer centres.

Technological change, in particular the introduction of sophisticated imaging technologies, will create new skill requirements in the field.

Characteristics of Occupation

Estimated Employment in 2000: 5,900

	(%)
Male	21
Female	79
Full-time	73
Part-time	27
Self-employed	0
Employees	100
Working away from home	98
Working at home	1
No fixed workplace address	1

Employment by Region

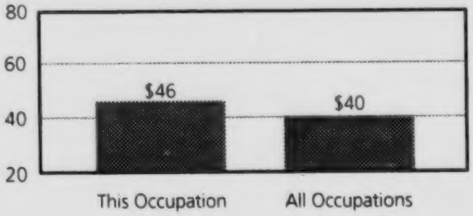
	(%) This Occupation	*(%) All Occupations*
Ottawa	11	10
Kingston-Pembroke	6	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	12	11
Toronto	37	42
London	6	5
Windsor-Sarnia	8	5
Stratford-Bruce Peninsula	3	3
Northeast	6	5
Northwest	3	2

Main Industries of Employment

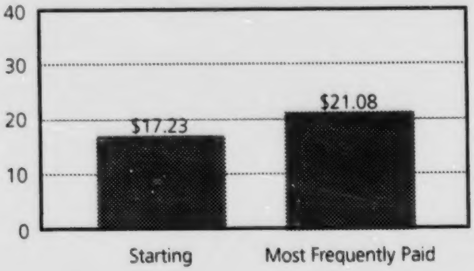
	(%)
Health and social service	96

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Canadian Association of Medical Radiation Technologists (www.camrt.ca)
College of Medical Radiation Technologists of Ontario (www.cmrto.org)
Ontario Association of Medical Radiation Technologists (www.oamrt.on.ca)

3233 Registered Practical Nurses

Description

Registered practical nurses provide nursing care for patients under the direction of registered nurses, physicians and other health team members. In some Canadian jurisdictions, and formerly in Ontario, this occupation is called registered nursing assistant.

Common job titles: Certified Nursing Assistant; Licensed Nursing Assistant; Licensed Practical Nurse; Operating Room Technician; Registered Nursing Assistant.

Typical employers: hospitals; offices of physicians, surgeons, dentists and other health practitioners; clinics; nursing homes; extended-care facilities; rehabilitation centres.

Selected Main Duties

Registered practical nurses perform some or all of the following duties:

- Take patients' blood pressure, temperature and pulse, distribute medication to patients, and perform other routine nursing procedures;
- Change patients' dressings, and bathe and dress patients;
- Assist registered nurses with procedures such as respiratory therapy, intravenous therapy, applying sterile compresses and removing sutures;
- Monitor patients' progress and report changes to registered nurses, doctors and other health team members.

Operating room technicians perform some or all of the following duties:

- Prepare patients for surgery by washing, shaving and sterilizing the patients' operative areas;
- Assist in surgery by laying out instruments, setting up equipment, assisting surgical teams with gowns and gloves and passing instruments to surgeons;
- Clean and sterilize the operating room and instruments.

Working environment: The typical work environment involves the general care of patients as part of a patient's care team. Weekend and shift work of eight to 12-hour duration is normal. Home visitation is becoming increasingly frequent as the focus of health care changes from institutional care to community care. Work is required on a 24-hour, 7-day week, shift basis. Good physical condition is required.

Education/Training

Provincial licensure is mandatory for registered practical nurses in Ontario. As of January 1, 2005, the occupation will require a baccalaureate degree in nursing as the minimum basic education requirement for registered nurses entering the profession. Licensing is achieved by passing the Canadian Nursing Examination given by the College of Nurses of Ontario. In order to gain employment, nursing assistants and practical nurses must be licensed by the College of Nurses of Ontario.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005 due to the long-term care needs of an ageing population. Employment will increase as the health care system shifts from institutional to home care for people with chronic illnesses and disabling conditions. In addition, a substantial number of job openings will arise each year from the need to replace workers who retire.

The role of registered practical nurses will change as more technology is introduced at the bedside. The growing complexity of nursing care and limiting of hospitalization to critically ill patients, will place additional educational demands on the workers employed in acute care.

Characteristics of Occupation

Estimated Employment in 2000: 23,400

	(%)
Male	5
Female	95
Full-time	59
Part-time	41
Self-employed	1
Employees	99
Working away from home	96
Working at home	0
No fixed workplace address	4

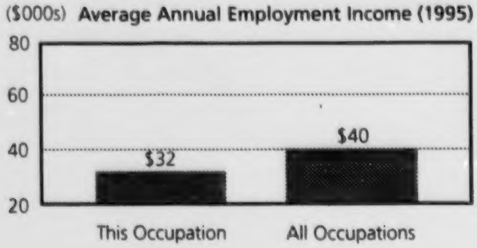
Employment by Region

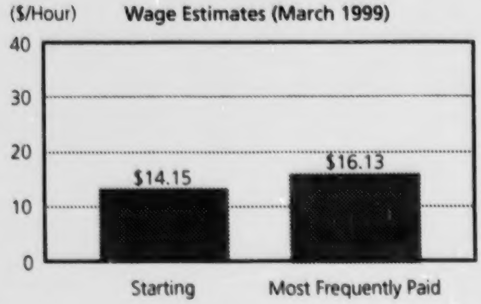
	(%) This Occupation	*All Occupations*
Ottawa	7	10
Kingston-Pembroke	6	4
Muskoka-Kawarthas	7	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	15	11
Toronto	24	42
London	8	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	5	3
Northeast	9	5
Northwest	4	2

Main Industries of Employment

	(%)
Health and social services	97

Income and Wages





For more information

College of Nurses of Ontario (www.cno.org)
Registered Practical Nurses Association of Ontario (www.cdn-domain.com/rpnao)
Registered Nurses Association of Ontario (www.rnao.org)

3234 Ambulance Attendants and Other Paramedical Occupations

Description

This group includes workers who administer pre-hospital emergency medical care to patients and transport them to hospitals or other medical facilities for further medical care.

Common job titles: Ambulance Attendant; Emergency Medical Attendant; Emergency Medical Technician; Emergency Medical Technician – Paramedic; Emergency Medical Care Assistant; Paramedic; Supervisor – Ambulance Service.

Typical employers: non-institutional health services; hospitals; provincial and municipal governments; manufacturing, mining and other private sector organizations.

Selected Main Duties

Workers in this occupation group perform some or all of the following duties:

- Assess extent of injuries or illness of trauma victims, patients with respiratory disease and stress, overdose and poisoning victims, industrial accident victims and other ill or injured individuals to determine emergency medical treatment;
- Administer pre-hospital emergency care, such as cardiopulmonary resuscitation (CPR), oxygen, bandaging and splinting to patients;
- Establish and maintain intravenous treatment (IV), apply adjunctive equipment for ventilation and circulation complications, administer medications and provide other advanced emergency treatment to patients;
- Transport patients by air, land or water to hospital or other medical facility for further medical care;
- Document and record nature of injuries and treatment provided;
- Assist hospital personnel with provision of medical treatment, if necessary;
- Maintain ambulances and emergency care equipment and supplies;
- Train and supervise other workers in this unit group.

Working environment: Ambulance attendants work both indoors and outdoors under a variety of weather conditions. Physical activity can be intense when dealing with very sick or injured individuals. Violence from drug overdose victims is also a threat. Exposure to diseases is possible and mental fatigue is great due to the stress of the occupation. The hours of work are compressed shifts of 8, 10 or 12 hours per day, and the worker must be available to work any of the 24 hours of the day and the 7 days of the week. Good physical condition is required. The patient, stretcher and equipment can easily weigh over 300 pounds.

Education/Training

Completion of a college, hospital-based or other recognized program in emergency medical technology ranging from two to twenty-four months or courses in emergency health care and supervised practical training are required. Certification according to type and length of training by an appropriate governing body is required. Graduates of a recognized community college course in ambulance and emergency care are eligible to take the provincially administered Emergency Medical Care Assistant (E.M.C.A.) examinations and, if successful, may be employed as ambulance officers in services operated by governments, hospitals and private companies and as air ambulance attendants in Ontario. According to the Ambulance Act, attendants must be at least 18 years of age, possess the appropriate level of vehicle license and a driving record with no offences, and provide proof of having a record without criminal offences to gain employment.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow more rapidly than the average for all occupations through the year 2005.

Many ambulance attendants are upgrading their qualifications to paramedic status.

Ambulance services typically do not advertise for workers. Graduates from college programs invariably send in unsolicited applications. As a general rule, workers are initially hired on a temporary basis and from there are moved to regular part-time and then to full-time positions, as vacancies become available.

Characteristics of Occupation

Estimated Employment in 2000: 4,800

	(%)
Male	77
Female	23
Full-time	80
Part-time	20
Self-employed	2
Employees	98
Working away from home	90
Working at home	1
No fixed workplace address	9

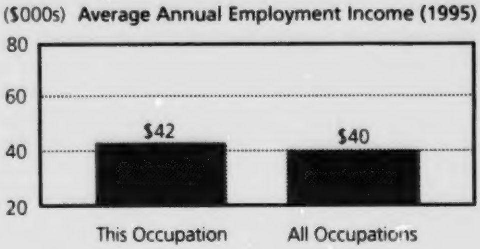
Employment by Region

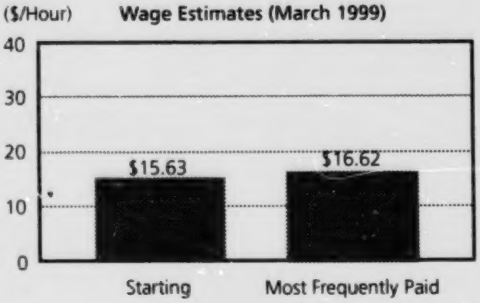
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	5	4
Muskoka-Kawarthas	6	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	12	11
Toronto	25	42
London	5	5
Windsor-Sarnia	7	5
Stratford-Bruce Peninsula	4	3
Northeast	15	5
Northwest	4	2

Main Industries of Employment

	(%)
Health and social services	86
Government services	7

Income and Wages





For more information

Ontario Paramedic Association (www.paramedic.on.ca)
Ontario Ambulance Operators' Association (www.oaoa.on.ca)
Paramedic Association of Canada (www.paramedic.ca)

3411 Dental Assistants

Description

Dental assistants assist dentists during the examination and treatment of patients and perform administrative functions.

Common job titles: Certified Dental Assistant; Certified Intra-Oral Dental Assistant; Dental Assistant; Registered Dental Assistant.

Typical employers: offices of physicians, surgeons and dentists; non-institutional health services; educational institutions; clinics.

Selected Main Duties

Dental assistants perform some or all of the following duties:

- Prepare patients for dental examination and assist the dentist during the examination;
- Sterilize and maintain instruments;
- Prepare filling materials;
- Advise patients on oral hygiene;
- Schedule patient appointments and record information on patient care;
- Invoice patients for dental services;
- Order dental and office supplies;
- Perform intra-oral duties such as taking and developing x-rays, polishing and cleaning teeth and applying fluoride treatment.

Working environment: Working in dentists' offices or clinics is the norm. Part-time employment and evening and Saturday work are becoming increasingly common.

Education/Training

Completion of a three-month to one-year college or other program in dental assistance or completion of secondary school with on-the-job training is required. Certification is not mandatory, but is required to perform intra-oral duties.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. The demand for dental assistants depends on the number of people seeking dental care and the frequency of their visits. Population growth and greater retention of natural teeth by older people will increase demand for dental services. Many opportunities are for entry-level positions offering on-the-job training.

An increased use of computers for recording and accessing patient information will lead to new computer training needs for dental assistants. The need for continuous learning will remain strong as new procedures, techniques and materials are introduced.

Characteristics of Occupation

Estimated Employment in 2000: 8,700

	(%)
Male	2
Female	98
Full-time	72
Part-time	28
Self-employed	1
Employees	99
Working away from home	98
Working at home	0
No fixed workplace address	2

Employment by Region

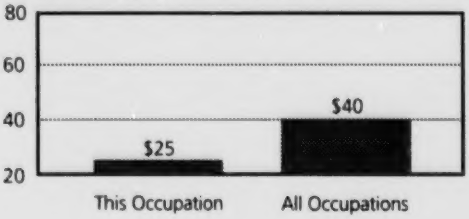
	(%) This Occupation	*(%) All Occupations*
Ottawa	8	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	12	11
Toronto	45	42
London	5	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	2	3
Northeast	4	5
Northwest	2	2

Main Industries of Employment

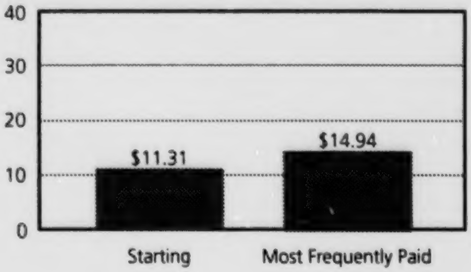
	(%)
Health and social service	98

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Canadian Dental Assistants' Association (www.cdaa.ca)
Ontario Dental Nurses and Assistants Association (www.odnaa.org)

3413 Nurse Aides and Orderlies

Description

Nurse aides and orderlies assist nurses, hospital staff and physicians in the basic care of patients. The difference between the titles of nurses aide and health care aide is that a health care aide has attended a formal training course and is normally paid at a slightly higher rate.

Common job titles: Health Care Aide; Hospital Porter; Nursing Attendant; Patient Care Aide; Ward Aide.

Typical employers: institutional health and social service firms; hospitals; non-institutional social services; offices of health practitioners; health and social service associations and agencies; non-institutional health services.

Selected Main Duties

Nurse aides and orderlies perform some or all of the following duties:

- Answer call signals; supply and empty bed pans; bathe, dress and groom patients; serve meal trays and feed patients; lift, turn or massage patients; shave patients prior to operations; supervise patients' exercise routines; and perform other duties related to patient care;
- Take patients' blood pressure, temperature and pulse; collect specimens such as urine, faeces or sputum; administer suppositories, colonic irrigations and enemas and perform other procedures as directed by nursing and hospital staff;
- Transport patients in wheelchair or stretcher for treatment or surgery;
- Carry messages, reports, requisitions and specimens from one department to another;
- Make beds and maintain patients' rooms;
- Maintain inventory of supplies.

Working environment: Full-time aides tend to work about 40 hours a week. Shift work may be necessary. Lifting of patients and long periods of standing may result in physical strain. Some duties may be considered unpleasant, such as emptying bedpans, changing soiled bed sheets and care for irritable patients. Part-time workers are normally used around the serving of meals and the hours can vary from employer to employer. Part-time staff could also be used to relieve full-time staff for days off due to holidays or sickness.

Education/Training

Some secondary school education and on-the-job training, or a nursing aide or health care aide college or private institutional program, or a college nursing orderly program and supervised practical training are required.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. Most working in this occupation are currently employed in hospitals. As the population ages, more jobs will become available in facilities providing services to the elderly.

Other trends that will affect work in these occupations include increasing computerization of patient records and greater use of machinery to lift patients.

Characteristics of Occupation

Estimated Employment in 2000: 44,900

	(%)
Male	12
Female	88
Full-time	57
Part-time	43
Self-employed	1
Employees	99
Working away from home	94
Working at home	1
No fixed workplace address	5

Employment by Region

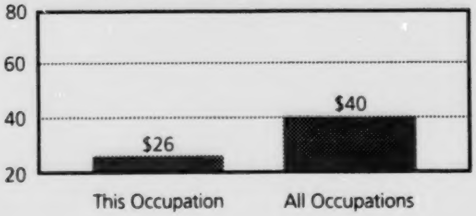
	(%)This Occupation	*(%) All Occupations*
Ottawa	12	10
Kingston-Pembroke	6	4
Muskoka-Kawarthas	5	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	12	11
Toronto	30	42
London	6	5
Windsor-Sarnia	8	5
Stratford-Bruce Peninsula	4	3
Northeast	5	5
Northwest	2	2

Main Industries of Employment

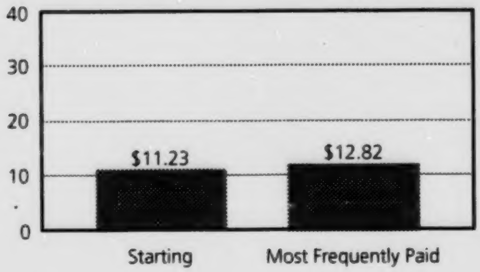
	(%)
Health and social service	96

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

College of Nurses of Ontario (www.cno.org)
Ontario Nurses' Association (www.ona.org)

4112 Lawyers

Description

Lawyers advise clients on legal matters, plead cases or conduct prosecutions in courts of law, represent clients before tribunals and administration boards and draw up legal documents such as contracts and wills. They may specialize in specific areas of law such as criminal law (lawyers only), corporate law, commercial law, real estate law, family and estate law, intellectual property law and labour law.

Common job titles: Attorney; Barrister; Corporate Counsel; Crown Prosecutor; Solicitor.

Typical employers: law firms; notary offices; prosecutor's offices; federal, provincial and municipal governments; various business establishments; self-employment.

Selected Main Duties

Lawyers perform some or all of the following duties:

- Advise clients of their legal rights and all matters related to law;
- Plead clients' cases before courts of law, tribunals and boards (lawyers only);
- Draw up legal documents such as real estate transactions, wills, divorces and contracts;
- Negotiate settlements of civil disputes (lawyers only);
- Perform administrative and management functions related to the practice of law;
- Act as executor, trustee or guardian in estate and family law matters.

Working environment: Lawyers operate in offices, libraries and courtrooms. Meetings with clients are also common as well as seminars and court appearances. Lawyers in private practice work irregular hours, while those who work in government or in private corporations generally have structured work schedules.

Education/Training

Two to three years of undergraduate studies and a bachelor's degree from a recognized law school, a period of articling and a bar admission course and successful completion of the bar examination set by the provincial law society are required. A license issued by the provincial law society is also required. In Ontario, lawyers are regulated by The Law Society of Upper Canada. Lawyers wishing to practice in another province may be required to pass examinations set by the relevant provincial law society.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through the year 2005. While job growth will create new positions, the majority of job openings will stem from replacement needs as workers retire.

Continuing demand for lawyers will result from growth in the population and the general level of business activities. The high cost of legal services, however, may lead to increased use of dispute-resolution systems in which lawyers' services are not mandatory. Also, electronic filings and the growth of computerized legal databases may increase the use of paralegal technicians instead of lawyers.

Some lawyers are particularly affected by the business cycle in the economy. Demand for legal services involving real estate transactions, mergers and acquisitions tend to decline during a recession, while those involving bankruptcy activities increases.

Characteristics of Occupation

Estimated Employment in 2000: 23,700

	(%)
Male	70
Female	30
Full-time	95
Part-time	5
Self-employed	50
Employees	50
Working away from home	94
Working at home	5
No fixed workplace address	1

Employment by Region

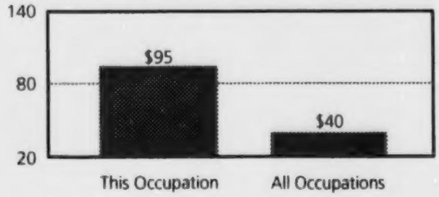
	(%) This Occupation	*(%) All Occupations*
Ottawa	14	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	5	9
Hamilton-Niagara Peninsula	6	11
Toronto	61	42
London	3	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	1	3
Northeast	2	5
Northwest	1	2

Main Industries of Employment

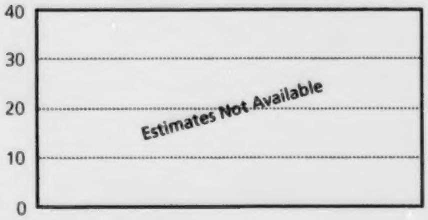
	(%)
Business service	83
Government service	11

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

The Law Society of Upper Canada (www.lsuc.on.ca)
Federation of Law Societies of Canada (www.flsc.ca)
Faculty of Law, University of Toronto (www.law.utoronto.ca)

4141 Secondary School Teachers

Description

Secondary school teachers prepare and teach academic, technical, vocational or specialized subjects at publicly funded and private secondary schools. They may specialize in such areas as mathematics, science, English, French, special education or second language instruction.

Common job titles: High School Biology Teacher; English as Second Language Teacher; Secondary School Department Head; Supply Teacher; High School Librarian.

Typical employers: private and publicly funded secondary schools.

Selected Main Duties

Secondary school teachers perform some or all of the following duties:

- Prepare subject material for presentation to students according to an approved curriculum;
- Teach students using a systematic plan of lectures, discussions, audio-visual presentations, and laboratory, shop and field studies;
- Assign and correct homework;
- Prepare, administer and correct tests;
- Evaluate progress of students and discuss results with parents and school officials;
- Participate in staff meetings, educational conferences and teacher training workshops;
- Advise students on course selection and on vocational and personal matters.

Working environment: Secondary school teachers operate in a classroom environment where learning is the focus. Dealing with disruptive students may be stressful and require additional work. After adding in extra-curricular activities, teachers may work more than 40 hours a week. A ten-month school year is common.

Education/Training

Teachers of academic subjects require a bachelor's degree in education, which is often preceded by a bachelor's degree in the arts or sciences. Teachers of vocational or technical subjects, require a bachelor's of education, which is usually preceded by several years of training or experience in the subject. Department heads require several years of teaching experience. To specialize in special education or English or French as a second language, additional training is required.

A provincial teaching certificate is required. Teachers from other provinces may apply for an Ontario teaching certificate after completing one full year of teaching in the province. The Ontario College of Teachers licenses, governs and regulates the teaching profession. Progression to vice-principal of other administrative positions is possible with experience.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Assuming relatively little change in average class size, employment growth of teachers depends on school age population growth rates and corresponding student enrolments. Enrolment of 14 to 17-year olds is expected to increase through year 2005.

While job growth will create new positions, replacement needs should increase significantly as a large number of secondary school teachers reach retirement age. Due to the accelerated retirement practices currently under way, there may be shortages of teachers in some communities or in particular subject areas.

Changes in curriculum policies and changes in the credit structure brought about by the educational reforms, most particularly the elimination of grade 13, will affect the demand of secondary school teachers. Technological change, such as the use of computers and the Internet, is also likely to affect teaching methods.

Characteristics of Occupation

Estimated Employment in 2000: 63,800

	(%)
Male	48
Female	52
Full-time	86
Part-time	14
Self-employed	0
Employees	100
Working away from home	95
Working at home	1
No fixed workplace address	4

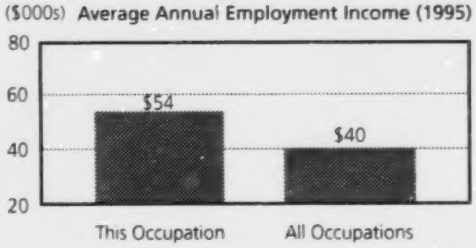
Employment by Region

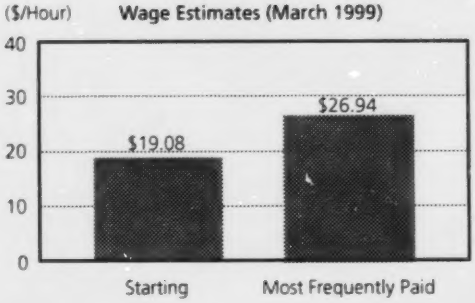
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	12	11
Toronto	39	42
London	6	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	3	3
Northeast	6	5
Northwest	2	2

Main Industries of Employment

	(%)
Educational service	100

Income and Wages





For more information

Ontario College of Teachers (www.oct.on.ca)
Canadian Teachers' Federation (www.ctf-fce.ca)

4142 Elementary School and Kindergarten Teachers

Description

Elementary school and kindergarten teachers teach basic subjects such as reading, writing and arithmetic or specialized subjects such as English or French as a second language and special education at publicly funded and private elementary schools. Elementary school librarians are included in this group.

Common job titles: Elementary School Teacher; French Immersion Teacher; Primary School Teacher; Librarian – Elementary School.

Typical employers: private and publicly funded elementary schools.

Selected Main Duties

Elementary school and kindergarten teachers perform some or all of the following duties:

- Prepare courses for presentation to students according to approved curriculum;
- Teach students using a systematic plan of lessons, discussions, audio-visual presentations and field trips;
- Lead students in activities to promote their physical, mental and social development and their school readiness;
- Assign and correct homework;
- Prepare, administer and correct tests;
- Evaluate the progress of students and discuss results with students, parents and school officials;
- Participate in staff meetings, educational conferences and teacher training workshops;
- Supervise teachers' aides.

Working environment: Kindergarten and elementary school teachers spend much of their time interacting and teaching in their classroom. Dealing with disruptive children can be tiring and stressful. Most teachers work a ten-month year with summer vacation for two to three months.

Education/Training

A bachelor's degree in education is required. Additional training is required to specialize in special education or second language instruction. A provincial teaching certificate is required. Additional certification is required to teach English or French as a second language. In Ontario, the Ontario College of Teachers licenses, governs and regulates the teaching profession. Progression to education consultant or school principal is possible with experience.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Many more job openings will be created each year from the need to replace workers who retire.

The demand for educators of younger students depends heavily on both the size and the student-teacher ratios of the elementary school population. Another factor in employment prospects will be the accelerated retirement practices currently under way in Ontario. Part-time work may also play a role in future employment patterns of this occupational group.

Characteristics of Occupation

Estimated Employment in 2000: 73,700

	(%)
Male	19
Female	81
Full-time	82
Part-time	18
Self-employed	0
Employees	100
Working away from home	94
Working at home	1
No fixed workplace address	5

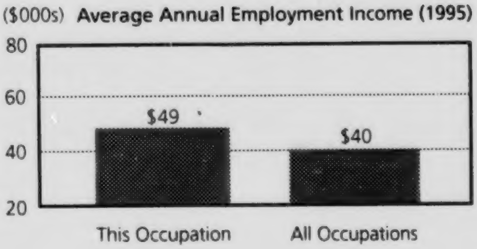
Employment by Region

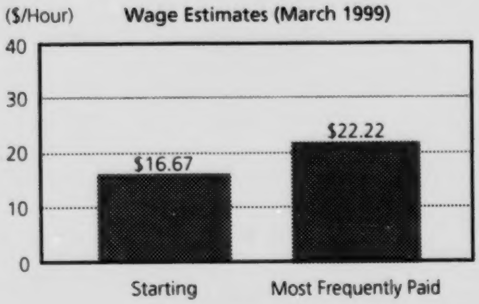
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	12	11
Toronto	39	42
London	5	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	3	3
Northeast	6	5
Northwest	2	2

Main Industries of Employment

	(%)
Educational service	100

Income and Wages





For more information

Ontario College of Teachers (www.oct.on.ca)
Association of Early Childhood Educators, Ontario (www.cfc-efc.ca/aeceo)
Canadian Teachers' Federation (www.ctf-fce.ca)

4143 School and Guidance Counsellors

Description

School and guidance counsellors advise students on educational issues, career planning and personal development, and co-ordinate the provision of counselling services to students, parents and teachers. Some may also teach classes.

Common job titles: Educational Counsellor; Guidance Counsellor; Student Counsellor.

Typical employers: elementary and secondary schools; colleges and other related schools; universities.

Selected Main Duties

School and guidance counsellors perform some or all of the following duties:

- Counsel students regarding educational issues such as course selection, school adjustment, truancy, study habits and career planning;
- Counsel students regarding personal and social issues such as substance abuse, depression, sexuality, self-esteem and family problems;
- Consult with teachers and parents regarding various issues and concerns, and with administrators and community agencies regarding programs and referrals;
- Co-ordinate the provision of counselling and information services to students, parents and teachers, such as career information services, professional development sessions and interactions with other educational institutions;
- Administer and interpret standardized intelligence, aptitude and interest tests;
- Teach regular classes.

Working environment: School counsellors follow the regular 9 to 10-month school year with similar hours as teachers. College career planning and placement counsellors may be required to hold a flexible schedule during recruitment periods.

Education/Training

A bachelor's degree in education is required. Graduate courses in counselling are also usually required. A teacher's certificate from the province of employment is required. Some teaching experience is usually required. In Ontario, the Ontario College of Teachers licenses, governs and regulates the teaching profession.

Employment Prospects

Over the next five years: Good

Educational policy, funding of education services and enrolment influence the demand for school and guidance counsellors. Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005 as a result of increasing enrolments in secondary schools. However, fiscal constraints may limit opportunities in the field. In addition to job growth, many job openings will be created each year from the need to replace counsellors who retire.

Part-time work and positions shared between schools are likely to affect the work of counsellors. Intermittent upgrading and professional development will be required in order to take full advantage of information provided by computerized guidance materials and the Internet.

Characteristics of Occupation

Estimated Employment in 2000: 3,000

	(%)
Male	33
Female	67
Full-time	86
Part-time	14
Self-employed	0
Employees	100
Working away from home	95
Working at home	1
No fixed workplace address	4

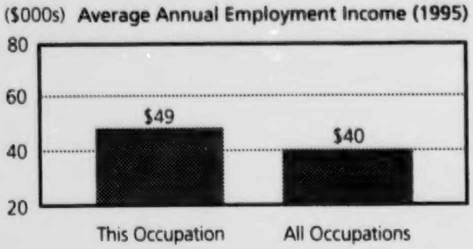
Employment by Region

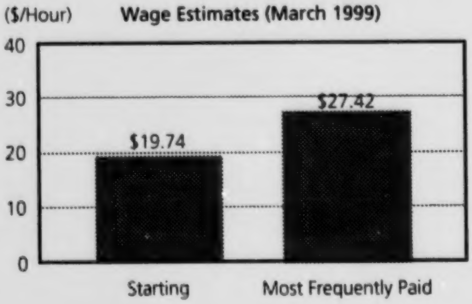
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	11	11
Toronto	41	42
London	8	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	2	3
Northeast	7	5
Northwest	5	2

Main Industries of Employment

	(%)
Educational service	98

Income and Wages





For more information

Ontario School Counsellors' Association (osca.ouac.on.ca)
Ontario College of Teachers (www.oct.on.ca)

4151 Psychologists

Description

Psychologists diagnose psychological and emotional disorders, counsel clients and provide therapy, undertake research, and apply theory relating to behaviour and mental processes.

Common job titles: Clinical Psychologist; Experimental Psychologist; Research Psychologist.

Typical employers: hospitals; elementary and secondary schools; offices of social services practitioners; non-institutional social services; non-institutional health services; universities; offices of physicians, surgeons and dentists; federal and provincial governments.

Selected Main Duties

Psychologists perform some or all of the following duties:

- Examine behaviour, diagnose psychological and emotional disorders, counsel clients and provide therapy;
- Counsel individuals and groups to achieve more effective personal, social and vocational development and adjustment;
- Apply psychological theory and principles regarding behaviour and mental processes such as learning, memory, perception and language development;
- Formulate hypotheses and experimental designs, review literature, conduct studies and publish research papers.

Working environment: The work environment for psychologists depends on the specialty chosen. Clinical, school and counselling psychology may allow for individually determined hours. Others in health facilities may work weekends and nights. There is also the possibility of pressures due to deadlines, tight schedules, overtime work and travel to attend conferences or for research purposes.

Education/Training

In Ontario, a doctoral degree in psychology is required. A period of supervised practical experience and the successful completion of provincial written and/or oral examinations is usually required. Psychologists are regulated health service providers. To practice the profession of psychology in Ontario, a person must be a member of the College of Psychologists of Ontario and hold a certificate of registration from the College.

Psychologists may specialize in clinical psychology or experimental research. They may also specialize in specific areas such as behavioural psychology, child psychology, cognitive psychology, developmental psychology, educational psychology, industrial psychology, neuropsychology, social psychology or sports psychology.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow more rapidly than the average for all occupations through the year 2005. Many more job openings will be created each year from the need to replace workers who retire. Psychologists with clinical specialization and those willing to work in correctional centres may have better job prospects.

Characteristics of Occupation

Estimated Employment in 2000: 4,400

	(%)
Male	37
Female	63
Full-time	75
Part-time	25
Self-employed	29
Employees	71
Working away from home	86
Working at home	12
No fixed workplace address	2

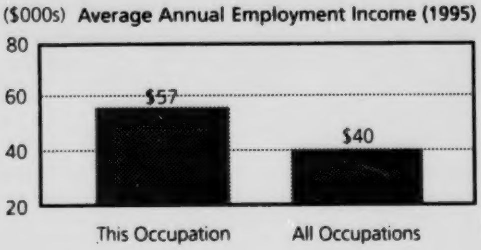
Employment by Region

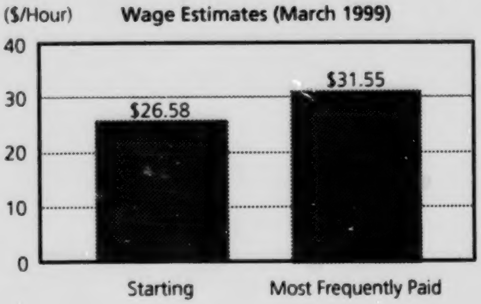
	(%) This Occupation	*(%) All Occupations*
Ottawa	23	10
Kingston-Pembroke	5	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	6	11
Toronto	45	42
London	5	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	1	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

	(%)
Health and social service	74
Educational service	15
Government service	7

Income and Wages





For more information

College of Psychologists of Ontario (www.cpo.on.ca)
Canadian Psychological Association (www.cpa.ca)
Ontario Psychological Association (www.psych.on.ca)

4152 Social Workers

Description

Social workers treat social functioning difficulties, provide counselling, therapy and referral to other supportive social services, and evaluate child development and the adequacy of childcare.

Common job titles: Co-ordinator of Social Work; Psychiatric Social Worker; Medical Social Worker.

Typical employers: non-institutional social services; hospitals; institutional health and social services firms; federal, provincial and municipal governments; elementary and secondary schools; non-institutional health services; health and social service associations and agencies.

Selected Main Duties

Social workers perform some or all of the following duties:

- Interview clients individually, in families or in groups, to assess their situation and problems and determine the types of services required;
- Provide counsel and therapy to assist clients in developing skills to deal with and resolve their social and personal problems;
- Plan programs of assistance for clients including referral to agencies that provide financial assistance, legal aid, housing, medical treatment and other services;
- Investigate cases of child abuse or neglect and take authorized protective action when necessary;
- Serve as members on inter-disciplinary teams of professionals working with client groups;
- Act as advocates for client groups in the community and lobby for solutions to problems directly affecting client groups;
- Develop or advise on social policy, conduct social research and assist in community development;
- Supervise other social workers.

Working environment: Most social workers operate within a standard 40-hour workweek. Flexible scheduling may be required to accommodate client needs and they may be on call for emergencies and work evenings and on weekends. Some travelling to meet with clients may be required. Work may be emotionally draining with considerable pressure.

Education/Training

A bachelor's degree in social work is required. Supervised practical experience as well as the successful completion of provincial written and/or oral examinations is usually required. Also, membership in a provincial association of social workers is usually required. Certified social workers are regulated by the Ontario College of Certified Social Workers.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through the year 2005. Many social workers are employed in the health and social service systems. Programs in these sectors are heavily dependent on public funding. However, because of the large size of this occupational group, replacement needs are expected to create a large number of job openings yearly.

Employment prospects may be slightly better for individuals with advanced degree in social work and experience in fields such as geriatrics and substance abuse.

Characteristics of Occupation

Estimated Employment in 2000: 17,400

	(%)
Male	22
Female	78
Full-time	84
Part-time	16
Self-employed	3
Employees	97
Working away from home	95
Working at home	3
No fixed workplace address	2

Employment by Region

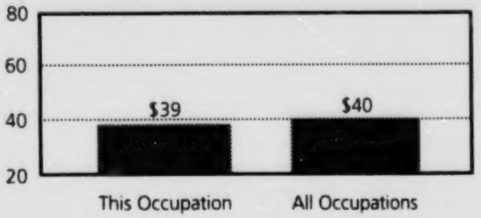
	(%) This Occupation	*(%) All Occupations*
Ottawa	13	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	9	11
Toronto	37	42
London	6	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	2	3
Northeast	7	5
Northwest	6	2

Main Industries of Employment

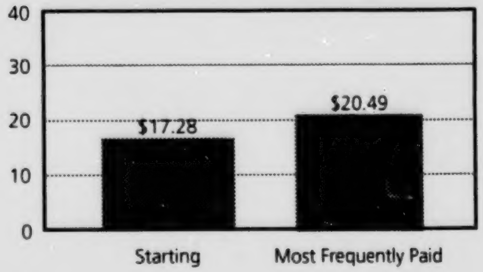
	(%)
Health and social service	76
Government service	16

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Ontario College of Certified Social Workers (www.occsw.org)
Ontario Association of Social Workers (www.web.net/~oasw)
Canadian Association of Social Workers (www.casw-acts.ca)

4162 Economists and Economic Policy Researchers and Analysts

Description

Economists and economic policy researchers and analysts conduct research and develop models to analyse and forecast economic behaviour and patterns.

Common job titles: Agricultural Economist; Economic Analyst; Financial Economist; Labour Economist; Tax Economist; Trade Economist.

Typical employers: federal, provincial and municipal governments; banks and other financial institutions; business services firms; management consulting firms; architectural, engineering and other scientific companies; electric power companies; telecommunication companies.

Selected Main Duties

Economists and economic policy researchers and analysts perform some or all of the following duties:

- Conduct research and develop models to illustrate and forecast economic behaviour and patterns, and devise methods for collection and analysis of data;
- Forecast production and consumption of agricultural products, based on records of past crops, labour supply and general economic and agricultural conditions;
- Analyse factors which determine economic growth and advise government agencies on policies to increase economic activities;
- Study mathematical formulae and statistical techniques and apply them to the testing and quantifying of economic theories and the solution of economic problems;
- Study the nature of money, credit and credit instruments and the operation of banks and other financial institutions to develop monetary policies and forecasts of financial activity;
- Examine problems related to the economic activity of individual companies;
- Examine financing methods, production costs and techniques and marketing policies to discover possible improvements;
- Examine statistical data on the exchange of goods and services among nations;
- Forecast production and consumption of renewable resources and supply, consumption and depletion of non-renewable resources;
- Conduct research on market conditions in local, regional or national area to set sales and pricing levels for goods and services and to assess market potential and future trends.

Working environment: Economists tend to have structured work schedules. They may work alone or as a part of a research team investigating a specific topic. Their routine may be interrupted by special requests for data, letters, meetings or conferences.

Education/Training

A bachelor's degree in economics is required. A master's or doctorate degree in economics may also be required. Depending on the nature of the work being done, an economist or policy analyst may require specialized or general academic training. Advances in computer technology have fundamentally changed the way in which economic research is conducted. Tasks such as accessing information, statistical analysis, economic projections and forecasting all require knowledge of both microcomputer technology and economic theory.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005.

Advancements in technology have enhanced the work capacity of these professionals. Computer technology has greatly reduced the tasks related to complex mathematical calculations and the storage and manipulation of large data sets. Candidates with quantitative statistical backgrounds and a sound knowledge of statistical and database software packages as well as excellent writing skills should have better employment opportunities.

Characteristics of Occupation

Estimated Employment in 2000: 3,800

	(%)
Male	67
Female	33
Full-time	93
Part-time	7
Self-employed	5
Employees	95
Working away from home	94
Working at home	5
No fixed workplace address	1

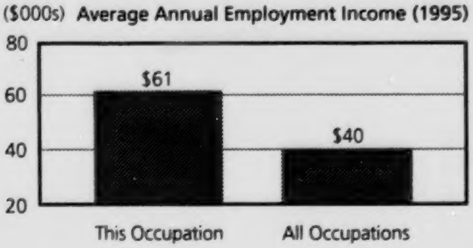
Employment by Region

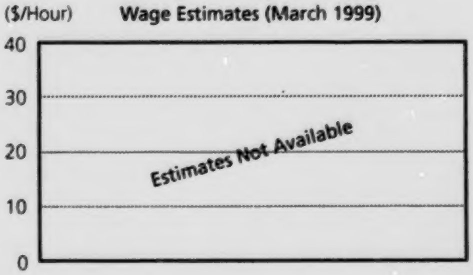
	(%) This Occupation	*(%) All Occupations*
Ottawa	52	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	0	3
Kitchener-Waterloo-Barrie	3	9
Hamilton-Niagara Peninsula	4	11
Toronto	35	42
London	1	5
Windsor-Sarnia	1	5
Stratford-Bruce Peninsula	0	3
Northeast	1	5
Northwest	0	2

Main Industries of Employment

	(%)
Government service	56
Business service	15
Finance and insurance	12

Income and Wages





For more information

National Association for Business Economics (www.nabe.com)
Canadian Economics Association (www.economics.ca)
Canadian Association for Business and Economics (www.cabe.ca)

4211 Paralegal and Related Occupations

Description

Legal assistants and paralegals in law firms assist lawyers by preparing legal documents, maintaining records and files and conducting research. Public notaries prepare promissory notes, wills, mortgages and other legal documents. Trade mark agents research and prepare trademark applications.

Common job titles: Commercial Law Clerk; Family Law Paralegal; Legal Researcher; Notary Public.

Typical employers: law firms; federal, provincial and municipal governments; business service firms.

Selected Main Duties

Legal assistants and paralegals in law firms perform some or all of the following duties:

- Assist lawyers by interviewing clients, witnesses and other related parties;
- Prepare legal documents, court reports and affidavits;
- Research records, court files and other legal documents.

Public notaries perform some or all of the following duties:

- Draft contracts, prepare promissory notes and draw up wills, mortgages and other legal documents;
- Administer oaths, take affidavits and depositions;
- Arrange probates and administer the estates of deceased persons;
- Witness and certify the validity of signatures on documents.

Trade mark agents perform some or all of the following duties:

- Search trademark registries to determine whether a trademark has been registered;
- Prepare and present applications for trademark registration;
- Advise clients on trademark laws and regulations.

Independent paralegals perform some or all of the following duties:

- Represent clients in small claims court and in other lower court proceedings;
- Advise clients and take legal action on landlord and tenant matters, traffic violations, name changes and other issues within their jurisdictions.

Working environment: Paralegals usually work in an office environment or a library. Travelling is occasionally required. A standard 40-hour workweek is the norm but very long hours are sometimes required to meet deadlines. The majority of paralegal work is for private law firms helping lawyers by preparing cases through research. However, there are a growing number of independent paralegal firms in Ontario.

Education/Training

Legal assistants and paralegals in law firms require a bachelor's degree in law or a college diploma in a legal assistant or law clerk program or in-house training from a law firm or other legal establishment. Public notaries require the completion of a one-year university public notary course and in-house training in a law office, notaries public office, bank, trust company, insurance or real estate firm. Public notaries require a provincial license. Independent paralegals require knowledge of legal principles and procedures usually obtained through industry-sponsored courses and through experience.

Trade mark agents require two years of in-house training under the supervision of a registered trade mark agent and successful completion of an examination conducted by the Patent and Trade Mark Institute of Canada. Trade mark agents require registration with the federal Trade Mark Office.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005.

Demand for paralegal services is affected by legislative rules governing paralegals' right to practice in various legal domains, as well as the overall economic environment. Paralegals are having some success in taking over routine legal services from lawyers. There is also a trend in specialization among paralegal firms.

Paralegals are likely to work increasingly with computerized filing systems and computerized legal databases.

Characteristics of Occupation

Estimated Employment in 2000: 13,200

	(%)
Male	23
Female	77
Full-time	86
Part-time	14
Self-employed	10
Employees	90
Working away from home	91
Working at home	5
No fixed workplace address	4

Employment by Region

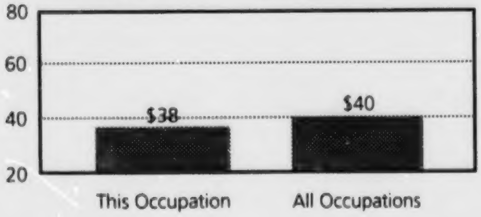
	(%) This Occupation	*(%) All Occupations*
Ottawa	11	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	7	11
Toronto	60	42
London	5	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	1	3
Northeast	2	5
Northwest	1	2

Main Industries of Employment

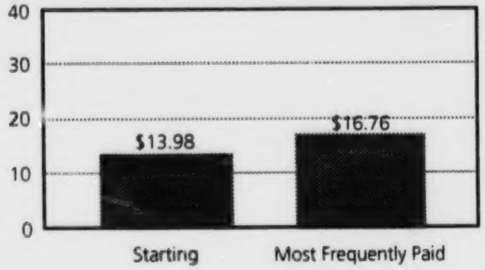
	(%)
Business service	75
Government service	11

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

The Law Society of Upper Canada (www.lsuc.on.ca)
Institute of Law Clerks of Ontario (www.ilco.on.ca)
Paralegal Society of Ontario (www.paralegalsocietyont.org)

4212 Community and Social Service Workers

Description

Community and social service workers administer and implement a variety of social assistance programs and community services, and assist clients to deal with personal and social problems.

Common job titles: Addictions Worker; Crisis Intervention Worker; Family Service Worker; Income Maintenance Officer; Mental Health Worker; Veterans Service Officer.

Typical employers: non-institutional social services; institutional health and social services firms; hospitals; federal, provincial and municipal governments; non-institutional health services; health and social service associations and agencies.

Selected Main Duties

Community and social service workers perform some or all of the following duties:

- Interview clients to obtain case history and background information;
- Prepare intake reports;
- Assess and investigate eligibility for social benefits;
- Meet with clients to assess their progress, give support and discuss any difficulties or problems;
- Refer clients to other social services;
- Advise and aid recipients of social assistance and pensions;
- Counsel and provide assistance to clients living in group homes and half-way houses and supervise their activities;
- Provide crisis intervention and emergency shelter services;
- Implement life skills workshops, substance abuse treatment programs, youth services programs and other community and social service programs under the supervision of social workers or health care professionals;
- Assist in evaluating the effectiveness of treatment programs by tracking clients' behavioural changes and responses to interventions;
- Maintain contact with other social service agencies involved with clients to provide information and obtain feedback on clients' overall progress.

Working environment: Generally working in a clinical, office or community setting, social service workers must deal with mental fatigue associated with social work. Addicts, dysfunctional individuals or families, or abused women are among the client groups. Some social workers may experience physical harm and some wear a portable alarm for security against such incidents. Most community care and social workers are required to work shifts.

Education/Training

Completion of a college or university program in social work, counselling or other social science discipline is usually required. Previous work experience in a social service environment as a volunteer or in a support capacity may substitute for formal education requirements for some occupations in this unit group. Community and social service workers may study a wide variety of college-level programs.

Progression to professional occupations in social services, such as family and marriage counsellors, social workers, and probation and parole officers, is possible with additional training and/or experience.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to increase more slowly than the average for all occupations through the year 2005. Many job openings will be created each year from the need to replace workers who retire.

Most employment opportunities for this occupation are found in the service sector, primarily in non-institutional health services such as community mental health and addictions clinics. A significant number of jobs are also affiliated with government agencies in areas such as income maintenance, social services and corrections. Some job opportunities can also be found in the private sector.

Characteristics of Occupation

Estimated Employment in 2000: 25,500

	(%)
Male	24
Female	76
Full-time	74
Part-time	26
Self-employed	1
Employees	99
Working away from home	92
Working at home	3
No fixed workplace address	5

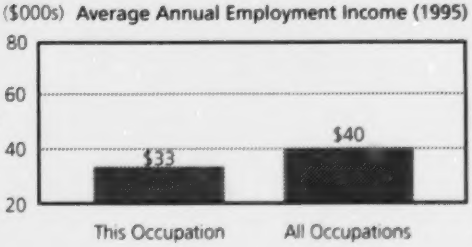
Employment by Region

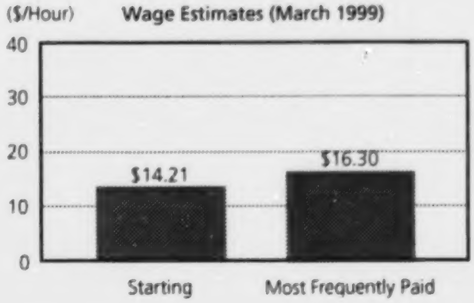
	(%) This Occupation	*(%) All Occupations*
Ottawa	8	10
Kingston-Pembroke	6	4
Muskoka-Kawarthas	5	3
Kitchener-Waterloo-Barrie	11	9
Hamilton-Niagara Peninsula	11	11
Toronto	32	42
London	6	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	3	3
Northeast	8	5
Northwest	5	2

Main Industries of Employment

	(%)
Health and social service	75
Government service	15

Income and Wages





For more information

Ontario Mental Health Foundation (www.inforamp.net/~omhf)
Ontario Association for Community Living (www.acl.on.ca)
Canadian Association for Community Living (www.cacl.ca)
Canadian Association of Schools of Social Work (www.cassw-acess.ca)

5111 Librarians

Description

Librarians develop, organize and maintain library collections and provide advisory services for users.

Common job titles: Bibliographer; Cataloguer; Librarian; Library Consultant; Supervisor – Library.

Typical employers: libraries; universities; federal, provincial and municipal governments; elementary and secondary schools; colleges and other related schools.

Selected Main Duties

Librarians perform some or all of the following duties:

- Recommend acquisition of books, periodicals, audio-visual and other materials for inclusion in library collections;
- Classify and catalogue library materials;
- Prepare bibliographies, indexes, reading lists, guides and other finding aids;
- Develop systems to access library collections;
- Perform manual and on-line reference searches, make inter-library loans and perform other functions to assist users in accessing library materials;
- Provide specialized programs such as story time reading for children;
- Conduct library information and orientation training sessions;
- Supervise library technicians, assistants and clerks.

Working environment: Full-time employment is typically 35 to 40 hours per week. Most public and academic libraries are open on weekends and on evenings. Extended work at video display consoles may cause eyestrain and headaches. Librarians are busy even during the traditionally slow summer months when they conduct programs for children.

Education/Training

A master's degree in library science or information science is required for employment in most public library systems. In most cases, full-time positions are filled from their part-time pool. Banks, large corporations, law and accounting firms may also employ fully qualified librarians to initially set up their libraries.

Employment Prospects

Over the next five years: Limited

Employment for this occupation is expected to decline through 2005, with most job openings occurring as older workers retire. This occupation is increasingly sensitive to changing technology and the level of expenditures in the cultural sector.

The increasing availability of computerized reference material, both on the Internet and on compact disks, is transforming the work of librarians. Growing use of computerized information storage will mean that archivists must organize information retrieval systems that allow easy and reliable access to stored data. Work in the private sector which includes maintaining and organizing corporate archives and corporate memory systems may expand given the proliferation of digitized information.

Characteristics of Occupation

Estimated Employment in 2000: 4,300

	(%)
Male	17
Female	83
Full-time	72
Part-time	28
Self-employed	0
Employees	100
Working away from home	98
Working at home	1
No fixed workplace address	1

Employment by Region

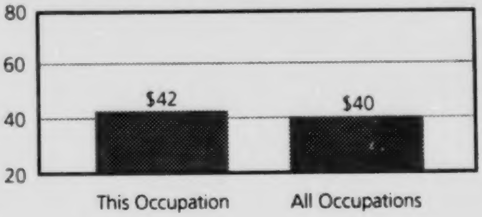
	(%) This Occupation	*(%) All Occupations*
Ottawa	19	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	8	11
Toronto	41	42
London	8	5
Windsor-Sarnia	3	5
Stratford-Bruce Peninsula	2	3
Northeast	4	5
Northwest	1	2

Main Industries of Employment

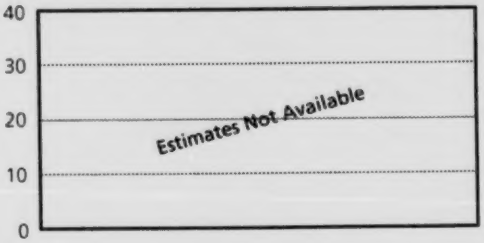
	(%)
Educational service	74
Government service	9

Income and Wages

($000s) Average Annual Employment Income (1995)



($/Hour) Wage Estimates (March 1999)



For more information

Ontario Library Association (www.accessola.com)
Canadian Library Association (www.cla.ca)

5121 Writers

Description

Writers plan, research and write books, scripts, plays, advertising copy, speeches, manuals, specifications and other non-journalistic articles for publication or presentation.

Common job titles: Advertising Copywriter; Copywriter; Essayist; Humorist; Novelist; Playwright; Poet; Scientific Writer; Script Writer; Short-story Writer; Specifications Writer; Speech Writer; Technical Writer; Television Writer; Writer.

Typical employers: services firms; federal and provincial governments; advertising firms; television and radio broadcasting companies; computer service firms; publishing companies; architectural, engineering and other scientific companies; combined publishing and printing companies; self-employment.

Selected Main Duties

The following is a summary of the main duties of some occupations in this group:

- *Novelists, playwrights, script writers, poets* and *other creative writers* conceive and write novels, plays, scripts, poetry and other material for publication or presentation and may conduct research to establish factual content and to obtain other necessary information;
- *Technical writers* analyse material, such as specifications, notes and drawings, and write manuals, user guides and other documents to explain clearly and concisely the installation, operation and maintenance of electronic equipment and software. Some technical writers concentrate on writing detailed documentation of the technical operation of hardware and software systems for data processing managers and other highly skilled technical staff. Others translate technical terms and concepts into everyday language. They often reduce key tasks to step by step instructions and tutorials and on-line help screens;
- *Copywriters* study and determine selling features of products and services and write text for advertisements and commercials.

Working environment: The working environment for writers can be quite diverse. Some work at home and transmit their work via fax and modem. Technical writers and copywriters may work in a busy office or in solitude. Those working in an office usually work a 35 to 40-hour week. The hours for creative writers tend to be flexible. Freelancing is a common employment arrangement.

Education/Training

Technical writers usually require a university degree in the area of specialization, such as computer science or engineering, in addition to excellent communication skills. Copywriters usually require a university degree or college diploma in English, French, marketing or other discipline.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. While job growth will create new positions, many job openings will result from replacement needs as writers retire.

Computers are transforming writers' work in several ways. Computer programming creates a strong demand for technical writers familiar with programming. The use of the Internet and computerized reference materials has changed writers' research methods significantly. Modems allow rapid transfer of material between writer, editor and publisher.

Writers are also finding self-employment opportunities due to the practice of contracting-out and the proliferation of niche publications (including Internet publications).

Characteristics of Occupation

Estimated Employment in 2000: 12,200

	(%)
Male	47
Female	53
Full-time	71
Part-time	29
Self-employed	44
Employees	56
Working away from home	47
Working at home	50
No fixed workplace address	3

Employment by Region

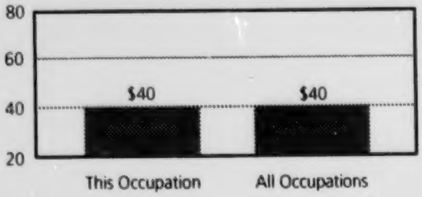
	(%) This Occupation	*(%) All Occupations*
Ottawa	19	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	5	9
Hamilton-Niagara Peninsula	5	11
Toronto	58	42
London	3	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	1	3
Northeast	1	5
Northwest	1	2

Main Industries of Employment

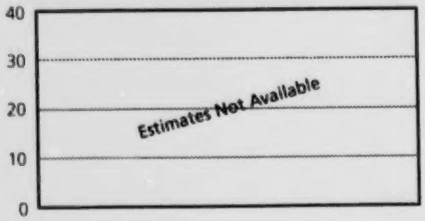
	(%)
Other service	43
Business service	22
Manufacturing	13
Government service	8

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Canadian Authors Association (www.canauthors.org)

Periodical Writers Association of Canada (www.web.net/~pwac)

5122 Editors

Description

Editors review, evaluate and edit manuscripts, articles, news reports and other material for publication or broadcast, and co-ordinate the activities of writers, journalists and other staff.

Common job titles: Advertising Editor; Art Editor; Associate Editor; Copy Editor; Editor; Manuscript Editor; News Editor; Photo Editor; Production Editor; Script Editor; Sports Editor; Technical Editor.

Typical employers: combined publishing and printing companies; publishing companies; business services firms; television and radio broadcasting companies; federal government; universities; advertising firms; commercial printing firms.

Selected Main Duties

Editors perform some or all of the following duties:

- Evaluate suitability of manuscripts, articles, news copy and wire service dispatches for publication or broadcast and recommend or make changes in content, style and organization;
- Read and edit copy to be published or broadcast to detect and correct errors in spelling, grammar and syntax, and shorten or lengthen copy as space or time requires;
- Confer with authors, staff writers, reporters and others regarding revisions to copy;
- Plan layout or format of copy according to space or time allocations and significance of copy;
- Plan and co-ordinate activities of staff and assure production deadlines are met;
- Plan coverage of upcoming events and assign work accordingly;
- Negotiate royalties with authors and initiate payments to freelance staff.

Working environment: The work environment for editors varies with the kind of work being conducted. Some work in private offices; others operate in busy environments where many people perform similar or related duties in close proximity. Travel may be required to research information. The workweek runs 35 to 40 hours. Night and weekend work may also be required. Editors may work on a freelance basis.

Education/Training

A bachelor's degree in journalism, English, French or a related discipline is usually required. Generally, editorial positions are not entry-level occupations and several years of experience in journalism, writing, publishing or a related field are required.

Editors may specialize in a particular subject area, such as news, sports or features, or in a particular type of publication, such as books, magazines or manuals.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow more rapidly than the average for all occupations through the year 2005.

Technological change has increased the need for editors with skills in particular technical areas – for example, computer program manuals and Internet web site editing. There is also more work on a freelance basis as the practice of outsourcing grows. This trend is reinforced by the availability of modems to transfer material between writer, editor and publisher.

Characteristics of Occupation

Estimated Employment in 2000: 4,100

	(%)
Male	46
Female	54
Full-time	80
Part-time	20
Self-employed	15
Employees	85
Working away from home	81
Working at home	18
No fixed workplace address	1

Employment by Region

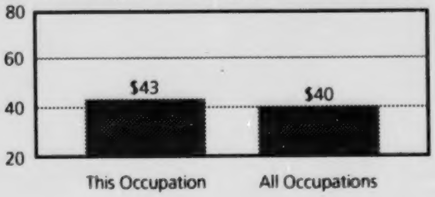
	(%) This Occupation	*(%) All Occupations*
Ottawa	7	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	5	9
Hamilton-Niagara Peninsula	6	11
Toronto	69	42
London	2	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	2	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

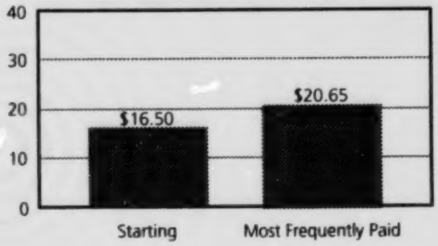
	(%)
Printing and publishing	58
Other service	12
Business service	8
Communication	7

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Editors' Association of Canada (www.editors.ca)
Canadian Publishers' Council (www.pubcouncil.ca)

5123 Journalists

Description

Journalists research, investigate, interpret and communicate news and public affairs through newspapers, television, radio and other media.

Common job titles: Book Reviewer; Broadcast Journalist; Columnist; Correspondent; Investigative Reporter; Journalist; News Analyst; News Commentator; Newspaper Critic; Network Reporter; Reporter; Television News Anchorperson.

Typical employers: combined publishing and printing companies; television and radio broadcasting companies; services firms; publishing companies; federal government; advertising firms; commercial printing firms.

Selected Main Duties

Journalists perform some or all of the following duties:

- Collect local, national and international news through interviews, investigation and observation;
- Write news stories for publication and broadcast;
- Receive, analyse and verify news and other copy for accuracy;
- Arrange for and conduct interviews as part of research and for radio and television programs;
- Research and report on developments in specialized fields such as medicine, science and technology;
- Prepare regular feature columns and stories on specialized topics;
- Write editorials and commentaries on topics of current interest to stimulate public interest and express the views of a publication or broadcasting station;
- Write critical reviews of literary, musical and other artistic works based on knowledge, judgement and experience.

Working environment: The work of journalists is often hectic. Deadlines present great pressures. Some journalists work in quiet offices while others operate in a noisy, busy environment. Reporters at the scene may be distracted by inquisitive bystanders, police or emergency workers. The dangers of covering disasters, wars or other hazardous events are obvious. Working hours are unpredictable with evening work, shift work and weekend work possible. Foreign correspondents travel and may work nights to meet deadlines back home.

Education/Training

A university degree or college diploma in journalism or a related field is usually required. Journalists may specialize in print or non-print media, in particular issues such as political affairs or entertainment news, or a particular geographic area.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. There are structural changes occurring in both electronic and print media. On the one hand, there are new and specialized television stations and additional cable channels. On the other hand, existing stations and newspapers are undergoing significant changes and mergers. These restructuring activities are reducing employment opportunities.

The continuing growth of niche publications and the development of Internet publishing create new opportunities for journalists. The newspaper and broadcasting industries are sensitive to economic cycles. During recessions, few new reporters are hired and some reporters lose their jobs.

Characteristics of Occupation

Estimated Employment in 2000: 3,900

	(%)
Male	52
Female	48
Full-time	80
Part-time	20
Self-employed	14
Employees	86
Working away from home	80
Working at home	18
No fixed workplace address	2

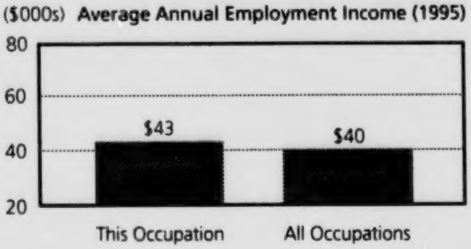
Employment by Region

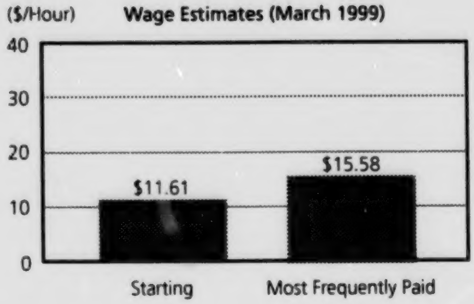
	(%) This Occupation	*(%) All Occupations*
Ottawa	18	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	8	11
Toronto	43	42
London	4	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	3	3
Northeast	6	5
Northwest	2	2

Main Industries of Employment

	(%)
Printing companies	53
Communication industries	25
Other service	12

Income and Wages





For more information

Ontario Community Newspapers Association (www.ocna.org)
Canadian Association of Journalists (www.eagle.ca/caj)
Canadian Newspaper Association (www.cna-acj.ca)

5124 Professional Occupations in Public Relations and Communications

Description

This occupation group includes specialists in public relations and communications who develop and implement communication strategies and information programs, publicize activities and events, and maintain media relations on behalf of businesses, governments and other organizations.

Common job titles: Communications Officer; Communications Specialist; Fundraising Consultant; Information Officer; Media Co-ordinator; Media Relations Officer; Museum Educator; Press Secretary; Public Affairs Officer; Public Relations Consultant; Publicist; Publicity Agent.

Typical employers: federal, provincial and municipal governments; business services firms; advertising firms; health and social service associations and agencies; hospitals; universities; television and radio broadcasting companies.

Selected Main Duties

Specialists in public relations and communications perform some or all of the following duties:

- Develop, implement and evaluate communications strategies and programs designed to inform clients, employees and the general public of initiatives and policies of businesses, governments and other organizations;
- Gather, research and edit material for internal and external audiences;
- Prepare or oversee preparation of reports, briefs, bibliographies, speeches, presentations and press releases;
- Develop and organize workshops, meetings, ceremonies and other events for publicity, fundraising and information purposes;
- Prepare and deliver educational and publicity programs to increase awareness of museums, galleries and other tourist attractions;
- Initiate and maintain contact with the media;
- Arrange interviews and news conferences;
- Act as spokesperson for an organization and answer written and oral inquiries;
- Assist in the preparation of brochures, reports, newsletters and other material.

Working environment: Although a standard 35 to 40-hour workweek is prevalent, deadlines often rearrange set schedules. Conferences, speeches, meetings and community activities require individuals to be flexible in their time allotment.

Education/Training

A university degree or college diploma in public relations, communications, journalism or a discipline related to a particular subject matter is usually required.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005.

While most firms and organizations recognize the need to sustain a positive public image, they tend to outsource much of the routine public relations work. This is made easier by computer and telecommunications technologies, which allow freelancers to work off-site.

Internships may provide a valuable way to obtain experience, as this occupation may be difficult to enter directly from post-secondary education.

Characteristics of Occupation

Estimated Employment in 2000: 11,900

	(%)
Male	35
Female	65
Full-time	80
Part-time	20
Self-employed	10
Employees	90
Working away from home	85
Working at home	11
No fixed workplace address	4

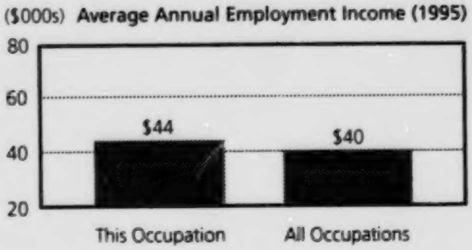
Employment by Region

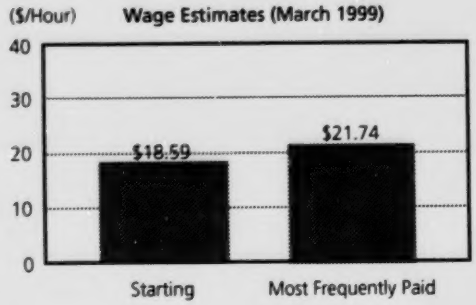
	(%) This Occupation	*(%) All Occupations*
Ottawa	21	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	5	9
Hamilton-Niagara Peninsula	9	11
Toronto	51	42
London	4	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	1	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

	(%)
Business service	23
Government service	18
Health and social service	17
Other service	13

Income and Wages





For more information

Canadian Public Relations Society, Inc. (www.cprs.ca)

International Association of Business Communicators (www.iabc-capitale.com)

5125 Translators, Terminologists and Interpreters

Description

Translators translate written material from one language to another. Terminologists conduct research required for translating and interpreting technical, professional and scientific vocabulary and material. Interpreters translate oral communication, such as speeches, proceedings and dialogue, from one language to another.

Common job titles: Conference Interpreter; Court Interpreter; Interpreter; Interpreter for the Deaf; Legal Terminologist; Literary Translator; Medical Terminologist; Sign Language Interpreter; Terminologist; Translator, Official Languages.

Typical employers: business services firms; federal, provincial and municipal governments; insurance companies; elementary and secondary schools; defence services.

Selected Main Duties

Translators perform some or all of the following duties:

- Translate a variety of written material such as correspondence, reports, legal documents, technical specifications and textbooks from one language to another, maintaining the content, context and style of the original material;
- Revise, edit, proofread and check translated material;
- Train and supervise other translators.

Terminologists perform some or all of the following duties:

- Conduct documentary and terminological research for the preparation of glossaries, technological files, dictionaries and resource centres;
- Provide consultative services to translators, interpreters and technical writers preparing legal, scientific or other documents requiring specialized terminologies.

Interpreters perform some or all of the following duties:

- Interpret oral communication from one language to another either simultaneously (as the speaker speaks) or consecutively (after the speaker speaks);
- Translate sign language to a spoken language and vice versa;
- Interpret language for individuals and small groups travelling in Canada and abroad.

Translators, terminologists and interpreters specialize in a particular language, such as French, English, Russian or Spanish, and may specialize in a particular technical area, such as law, medicine or agriculture.

Working environment: Translator's work environment is usually quiet and equipped with dictionaries and other reference materials. Interpreters work in soundproof booths listening through earphones to the speaker whose speech they are interpreting. Salaried translators work normal office hours with some overtime. Freelance translators work irregular hours depending on the work available. Sign language interpreters work in groups and individual situations and must be aware of the special needs of the deaf.

Education/Training

A bachelor's degree in translation or a related discipline is required, and specialization in interpretation, translation and terminology at the graduate level is usually required. Sign language interpreters require a college or other training program in sign language interpretation. The reserved title of certified translator is granted by the Association of Translators and Interpreters of Ontario under Ontario provincial statute and may be used only by translators who have passed the standardized national certification examination administered by the Canadian Translators and Interpreters Council.

Although most translation in Canada involves English and French, a minimum of three languages is usually required for translators and interpreters employed by international organizations.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. In addition, many job openings will be created each year from the need to replace workers who retire.

The demand for translators and others in these professions is shifting toward freelance operators as many organizations outsource for these services. As well, requirements for translating scientific and technical manuals are increasing. Currently translators between Spanish and English or French and between Asian and English or French are likely to have the best employment prospects.

Characteristics of Occupation

Estimated Employment in 2000: 4,600

	(%)
Male	36
Female	64
Full-time	66
Part-time	34
Self-employed	25
Employees	75
Working away from home	63
Working at home	24
No fixed workplace address	13

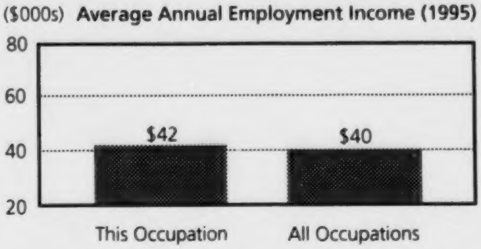
Employment by Region

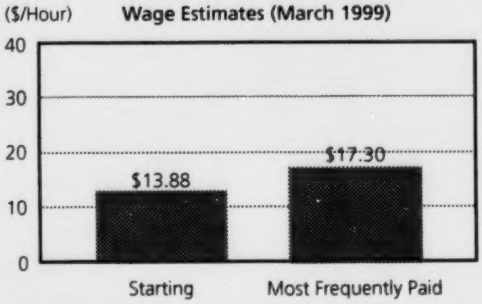
	(%) This Occupation	*(%) All Occupations*
Ottawa	33	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	0	3
Kitchener-Waterloo-Barrie	4	9
Hamilton-Niagara Peninsula	6	11
Toronto	48	42
London	2	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	0	3
Northeast	1	5
Northwest	2	2

Main Industries of Employment

	(%)
Business service	41
Government service	29
Other service	6
Educational service	5

Income and Wages





For more information

Association of Translators and Interpreters of Ontario (www.atio.on.ca)
Canadian Translators and Interpreters Council (www.synapse.net/~ctic)
The Interpreter's Network (www.terpsnet.com)

5223 Graphic Arts Technicians

Description

This occupational group includes workers who produce and assemble artwork, photographs, lettering and other graphic art according to conceptual layouts and specifications, and make camera-ready designs for printing.

Common job titles: Animation Painter; Copy Stylist; Lettering Artist; Mechanical Artist; Paste-up Artist; Sign Painter; Silkscreen Technician; Stencil Maker.

Typical employers: advertising firms; sign manufacturers; combined publishing and printing companies; commercial printing firms; business services firms; publishing companies.

Selected Main Duties

The following is a summary of the main duties for some occupations in this group:

- *Animation painters* paint or ink individual cells of animated film according to animator's specifications;
- *Copy stylists* designate type size and face to conform with layout and allocated space of copy to be printed on advertising pages of periodicals or catalogues;
- *Paste-up artists* arrange and mount art elements, photographs and text on paper according to the designer's or artist's layout to provide camera-ready copy, scale and crop art elements and prepare rules, borders and other mechanical elements;
- *Sign painters* lay out and paint letters, figures and designs, for advertisements, billboards and business signs, using layout instruments and painting equipment;
- *Stencil makers* lay out and cut stencils to desired specifications;
- *Lettering artists* paint and draw precise lettering for advertisements, books and other printed materials.

Working environment: Graphic arts technicians usually work in a well-lit studio conducive to the production of clean, attractive work.

Education/Training

A university degree or college diploma in commercial or graphic arts is usually required. On-the-job training may substitute for education for persons with demonstrated technical and artistic skills.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Some employers currently report difficulties in finding qualified workers to fill vacant positions.

Advancements in computer graphics have greatly enhanced the work of graphic and commercial artists but also added to the skills required to function effectively. Knowledge of computer graphics, in addition to creative talent, is now a requirement for employees. In some cases, the ability to use particular software is a precondition of employment. Film animation appears to be a growing graphic arts speciality.

The introduction of laser technology and digital photography will result in many graphic arts technicians (and photographers) using computer workstations.

Characteristics of Occupation

Estimated Employment in 2000: 1,800

	(%)
Male	66
Female	34
Full-time	83
Part-time	17
Self-employed	24
Employees	76
Working away from home	76
Working at home	18
No fixed workplace address	6

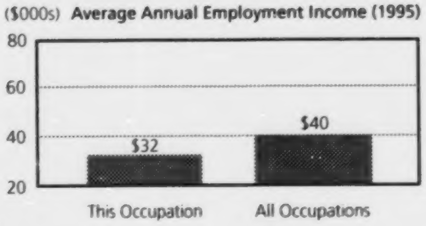
Employment by Region

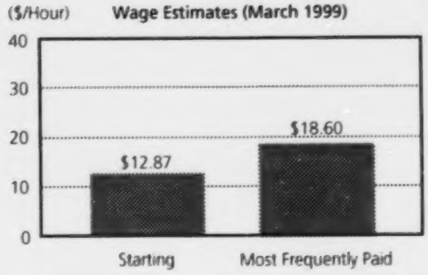
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	12	11
Toronto	50	42
London	6	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	2	3
Northeast	2	5
Northwest	2	2

Main Industries of Employment

	(%)
Other manufacturing	32
Printing companies	21
Business service	20
Other service	5

Income and Wages





For more information

Society of Graphic Designers of Canada (www.gdc.net)
Canadian Community Newspapers Association (www.ccna.ca)
Advertising and Design Club of Canada (www.adesigncanada.com)

5225 Audio and Video Recording Technicians

Description

Audio and video recording technicians operate equipment to record, mix and edit sound, music and videotape, for motion pictures, television and radio programs, videos, recordings and live events.

Common job titles: Audio Technician; Audiovisual Technician; Post-Production Technician; Radio Technician; Recording Engineer; Recording Studio Technician; Sound Effects Editor; Sound Engineer; Sound Mixer; Sound Technician; Video and Sound Recorder; Video Recording Technician.

Typical employers: motion picture, audio and video production companies; television and radio broadcasting companies; elementary and secondary schools; theatrical and staged entertainment services; business service firms.

Selected Main Duties

The duties of audio and video recording technicians can be divided into two categories: technical production activities used in the production of sound and picture images for film or videotape from set design to camera operation; and post-production where raw images are transformed to a final print or tape.

Audio and video recording technicians perform some or all of the following functions:

- Operate audio equipment to record and edit music, dialogue and sound effects for films, videos, radio and television programs and recordings;
- Operate videotape recording and editing equipment to record videos, television programs, concerts and live events, and to edit video tape after production;
- Operate audio consoles to mix music and sound at concerts and live events;
- Operate dubbing machines to play back edited dialogue, music and sound effect tracks from different sources, in synchronization with motion picture film;
- Supervise and co-ordinate the work of other audio and video recording technicians.

Working environment: The work requires using electronic equipment and involves exposure to noise. A five-day workweek of 40 hours based on shift rotations is normal.

Education/Training

Completion of a college or other program in recording engineering, audiovisual technology or a related field or experience as a recording studio assistant is usually required. College and university diploma programs are, however, considered to be an entrance requirement only. Entrants to the industry in production and post-production areas need to gain exposure to operations, on-the-job training, observe skilled practitioners and develop contacts within the company or the industry.

On-the-job training opportunities are somewhat dependent upon the type of employment: broadcasters employ the full range of skills; independent producers hire freelance technical crews on a project by project basis; laboratories employ post-production specialists and unions represent freelancers in both film and broadcasting.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through 2005. Technological advances in photography and sound recording have enabled equipment operators to perform functions more effectively and more easily. One source of demand comes from the corporate sector in areas such as filming training and educational videos and business meetings and the audio-video aspects of sales campaigns and public relations work. Video delivery via the Internet may increase demand over the forecast period.

The employment opportunities for sound recording technicians are dependent on the presence of recording studios in the greater Toronto Area. The restructuring in the media organizations, i.e., television stations and cable channels, may also contribute to employment opportunities here.

Characteristics of Occupation

Estimated Employment in 2000: 2,300

	(%)
Male	83
Female	17
Full-time	79
Part-time	21
Self-employed	17
Employees	83
Working away from home	80
Working at home	9
No fixed workplace address	11

Employment by Region

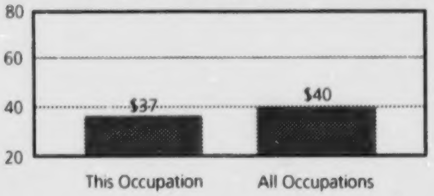
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	0	3
Kitchener-Waterloo-Barrie	4	9
Hamilton-Niagara Peninsula	7	11
Toronto	70	42
London	2	5
Windsor-Sarnia	1	5
Stratford-Bruce Peninsula	0	3
Northeast	1	5
Northwest	2	2

Main Industries of Employment

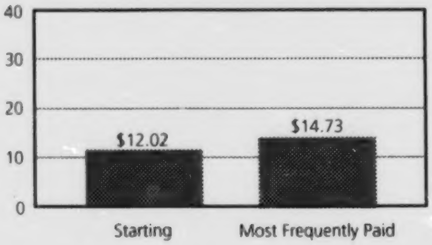
	(%)
Amusement and recreational service	55
Communication	18
Manufacturing	7
Educational service	7

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Audio Engineering Society (www.aes.org)
The Canadian Film and Television Production Association (www.ted.cftpa.ca)
Canadian Recording Industry Association (www.cria.ca)

5226 Other Technical Occupations in Motion Pictures, Broadcasting and the Performing Arts

Description

This occupation group includes a wide range of technical and supervisory workers who co-ordinate and perform specific activities for television, radio and motion picture productions, news broadcasts, theatre and stage productions, and other live or recorded productions.

Common job titles: Assistant Director; Casting Agent; Floor Director; Gaffer; Key Grip; Lighting Technician; Make-up Artist; Program Co-ordinator, Broadcasting; Special Effects Technician; Stage Manager; Stage Technician; Stunt Co-ordinator; Theatre Technician; Wardrobe Supervisor.

Typical employers: motion picture, audio and video production companies; theatrical and staged entertainment services; television and radio broadcasting companies; amusement and recreational service firms; motion picture exhibition services firms.

Selected Main Duties

The following is a summary of the main duties for some of the occupations in this group:

- *Floor directors* co-ordinate camera operators and other technical staff, and cue announcers, actors and performers during news broadcasts and television program tapings;
- *Key grips* supervise grips, gaffers and stagehands who rig, place, move and dismantle lights, sets, backdrops, scenery and other stage equipment;
- *Gaffers* and *lighting technicians* set up, operate and make repairs to lights and other electrical equipment in studios and on sets and stages;
- *Stunt co-ordinators* and *special effects technicians* design and co-ordinate special effects such as fires, explosions and crashes;
- *Make-up artists* apply cosmetic and special effects make-up on actors and other performers;
- *Wardrobe supervisors* oversee the acquisition and maintenance of costumes and wardrobes;
- Other workers in this unit group prepare television and radio schedules, audition and cast performers for roles, and schedule and oversee rehearsals.

Working environment: Most of the groups within this occupation work indoors in a studio, though some may also work outdoors on location sites. Gaffers and lighting technicians use electronic equipment, machinery and tools that can prove to be hazardous. The work done by stunt co-ordinators and special effects technicians is the most dangerous and requires them to be in contact with hazardous chemicals, flying particles and falling objects, and fires and explosions. The majority of workers within this occupation group are freelancers hired for specific jobs, short-term contract employees, as well as, producers and studio owners who operate as small businesses.

Education/Training

For most occupations in this group, completion of a college or university program in broadcasting, theatre arts or a related field and several years of experience in a related support or assisting occupation in motion pictures, broadcasting or the performing arts are required. For gaffers, lighting technicians, key grips and other stage technicians, completion of a college program or other specialized training program in technical production for theatre is required. Production managers need to know accounting and production management software. Administrators require management skills such as domestic and international marketing and fundraising grant writing, accounting, basic math and writing skills, and comprehension of collective agreements. Professional networking with fellow peers and others are vital to a successful career.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. This occupation group consists of a variety of job types. Technological developments are increasing the demand and skill levels for some and reducing the demand for others. Few job openings will occur due to older workers retiring since this occupation group consists of a relatively young workforce.

Areas with growing employment opportunities include application of new video editing, digital soundmixing and special optical effects technologies. Advancements in computer graphics and computer animation are putting a premium on a combination of creative and scientific and engineering skills. The emergence of multi-media is also increasing the demand for individuals with multi-disciplinary skills.

Characteristics of Occupation

Estimated Employment in 2000: 3,100

	(%)
Male	59
Female	41
Full-time	77
Part-time	23
Self-employed	17
Employees	83
Working away from home	64
Working at home	7
No fixed workplace address	29

Employment by Region

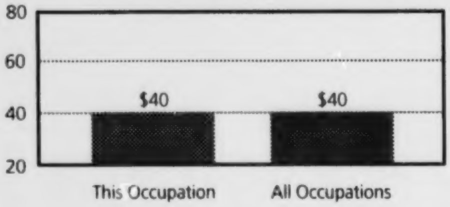
	(%) This Occupation	*(%) All Occupations*
Ottawa	4	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	3	9
Hamilton-Niagara Peninsula	6	11
Toronto	80	42
London	1	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	1	3
Northeast	1	5
Northwest	0	2

Main Industries of Employment

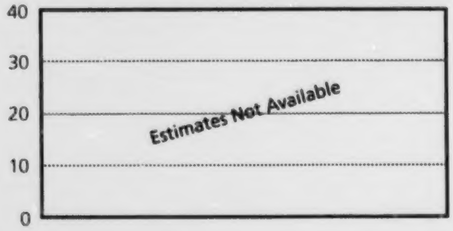
	(%)
Amusement and recreational service	66
Communication	15

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Alliance of Canadian Cinema, Television and Radio Artists (www.actra.com)
Associated Designers of Canada (www.culturenet.ucalgary.ca/adc)
Professional Association of Canadian Theatres (webhome.idirect.com/~pact)

5241 Graphic Designers and Illustrating Artists

Description

Graphic designers and illustrating artists conceptualize and produce designs, illustrations, layouts and visual images to effectively communicate information for publications, advertising, films, posters and signs.

Common job titles: Advertising Designer; Animator; Art Director; Commercial Artist; Graphic Artist; Graphic Designer; Illustrator; Layout Designer; Medical Illustrator; Page Designer; Scientific Illustrator; Title Artist.

Typical employers: business services firms; advertising firms; commercial printing firms; combined publishing and printing companies; services firms; sign manufacturers; computer service firms; publishing companies; motion picture, audio and video productions.

Selected Main Duties

Graphic designers and illustrating artists perform some or all of the following duties:

- Consult with clients to establish the nature and content of designs and illustrations for reproduction;
- Determine medium best suited to produce desired visual effect and method of reproduction;
- Prepare sketches, photographs or illustrations of subjects to be rendered;
- Estimate cost of materials and time to complete graphic design and illustration;
- Prepare specifications for design;
- Produce final designs or illustrations, or supervise the production of design by other graphic designers or graphic arts technicians.

Working environment: Graphic designers and illustrating artists usually work in well-lit studios. Freelance work is very common. Specific hours and days vary with the employer, the project and project deadlines. Overtime and weekend work is common.

Education/Training

A university degree in visual arts with specialization in graphic arts, commercial art or photography or completion of a college or other program in graphic arts or commercial art is usually required. Most people working in this occupation in Ontario are graduates of the Ontario College of Art and Design, a community college or equivalent program. Experience as a graphic arts technician may be required and may substitute for post-secondary training. They should also be familiar with the latest graphic computer software packages. Graphic artists need a portfolio of their published and unpublished work. This can include work done in school, as well as, freelance work or projects from a summer job or internship.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Replacement needs will create a large number of job openings yearly because of the large size of this occupation group.

Computer-based workstations have long replaced drawing boards. More and more, people in these occupations rely on computers to present concepts to clients, produce final designs and manage projects. The increased range of media presents new opportunities for these workers as well as the need to keep up with the latest trends in technology. People in this occupation increasingly use computerized page layout and graphic design systems in their work. Multimedia presentations and animated graphics are two types of work made far easier by computers. Website design may offer good opportunities for graphic designers and illustrators, especially those with multimedia skills.

Characteristics of Occupation

Estimated Employment in 2000: 19,900

	(%)
Male	58
Female	42
Full-time	81
Part-time	19
Self-employed	27
Employees	73
Working away from home	72
Working at home	25
No fixed workplace address	3

Employment by Region

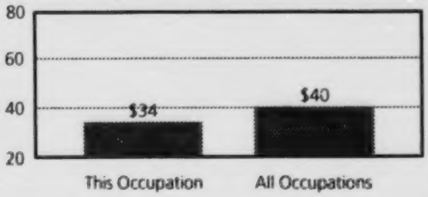
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	6	11
Toronto	64	42
London	3	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	1	3
Northeast	2	5
Northwest	1	2

Main Industries of Employment

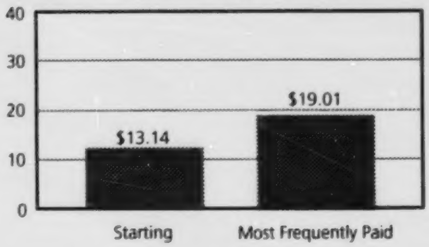
	(%)
Business service	50
Printing companies	18
Other service	10

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Society of Graphic Designers of Canada (Ontario) (www.gdc.net)
The Association of Registered Graphics Designers of Ontario (www.argdon.org)
Sheridan College of Applied Arts and Technology (www.sheridanc.on.ca)

5242 Interior Designers

Description

Interior designers conceptualize and produce aesthetic and functional designs for interior spaces in residential, commercial, institutional and industrial buildings. They may specialize in designing interiors for residences, offices, hotels, restaurants or retail establishments.

Common job titles: Building Space Planner; Interior Design Technician; Interior Designer; Kitchen Designer; Office Space Planner; Project Manager, Interior Design; Retail Space Planner.

Typical employers: business services firms; interior and finishing construction firms; architectural, engineering and other scientific companies; general merchandise stores.

Selected Main Duties

Interior designers perform some or all of the following duties:

- Consult with clients to determine needs, preferences and purpose of space;
- Develop detailed plans and models showing arrangement of walls, dividers, displays, lighting and other fixtures;
- Develop decorating plans and advise on selection of colour schemes, floor and wall coverings, furniture and other items;
- Estimate costs and materials required;
- Prepare specifications for the final interior designs;
- Direct site work crews.

Working environment: Interior designers usually work indoors in an office setting. Hours can be irregular and long especially when working to meet a deadline. The work and the rates of pay depend on the level of experience and the area of specialty. Commissions are an increasingly common means of payment for designers associated with retail establishments.

Education/Training

Educational requirements usually include completion of three to four years of post-secondary education in design and several years of practical experience and on-the-job training. Membership in the Association of Registered Interior Designers of Ontario is available to those who meet the Association's requirements.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow more rapidly than the average for all occupations through the year 2005. Employment in this occupation is largely dependent on construction and renovation activity in the residential, commercial and institutional real estate sectors. Higher income earners generate demand for services by private households; this, too, is related to activity in the residential real estate market.

Computers are used to aid in drafting, colour matching and final product visualization. Interior designers now need to have knowledge of these specialized computer packages.

Characteristics of Occupation

Estimated Employment in 2000: 5,000

	(%)
Male	29
Female	71
Full-time	76
Part-time	24
Self-employed	36
Employees	64
Working away from home	60
Working at home	33
No fixed workplace address	7

Employment by Region

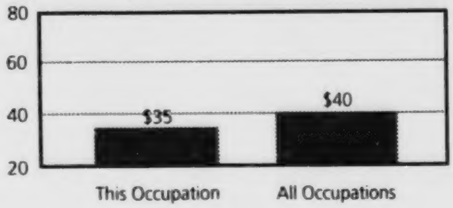
	(%) This Occupation	*(%) All Occupations*
Ottawa	14	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	9	11
Toronto	60	42
London	3	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	1	3
Northeast	1	5
Northwest	0	2

Main Industries of Employment

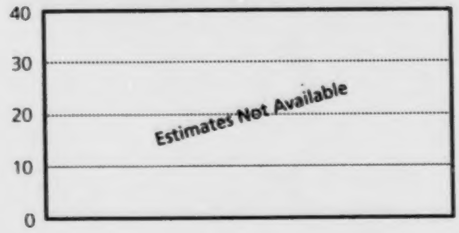
	(%)
Business service	61
Construction trade contracting	10
Retail trade	10

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Association of Registered Interior Designers of Ontario (www.arido.on.ca)
International Interior Design Association (www.iida.com)
Interior Designers of Canada (www.interiordesigncanada.org)

6221 Technical Sales Specialists, Wholesale Trade

Description

Technical sales specialists in wholesale trade sell a range of technical goods and services, such as scientific and industrial products. They usually specialize in a particular line of goods or services.

Common job titles: Communication Equipment Sales Representative; Industrial Supplies Sales Representative; Medical Instrumentation Sales Engineer; Software Sales Representative.

Typical employers: computer service firms; electrical and electronic machinery and equipment wholesalers; machinery and equipment wholesalers; machinery and equipment manufacturers; telecommunication companies; pharmaceutical companies; chemical products manufacturers; business machine manufacturers; industrial machinery equipment wholesalers.

Selected Main Duties

Technical sales specialists perform some or all of the following duties:

- Promote sales to existing clients;
- Identify and solicit potential clients;
- Assess client's needs and resources and recommend the appropriate goods or services;
- Provide input into product design where goods or services must be tailored to suit client's needs;
- Develop reports and proposals as part of sales presentation to illustrate benefits from use of goods or services;
- Estimate costs of installing and maintaining equipment or service;
- Prepare and administer sales contracts;
- Consult with clients after sale to resolve problems and to provide ongoing support;
- Supervise the activities of other technical sales specialists.

Working environment: Sales require constant interaction with clients. The physical level of work is moderate with few work hazards although some representatives carry around heavy sample cases. Meeting personal quotas as well as regional and company sales goals can be stressful. A 40-hour workweek is standard. Travel may be required. Compensation methods for wholesale sales specialists vary by type of firm and product sold. Most employers use a salary plus commission or salary plus bonus pay structure. Total compensation depends on performance and will vary depending on the type of products represented, experience in the field and the number of customers reached.

Education/Training

A university degree or college diploma in a program related to the product or service is usually required. Experience in sales or in a technical occupation related to the product or service may be required.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow more rapidly than the average for all occupations through the year 2005. Replacement needs will create many job openings yearly because of the large size of this occupational group.

There is also a growing interdependence between product development and sales. This link expands the specialist's role in providing vital information to product developers about customers' needs. Some sales representatives may also assist with the installation of new products or deliver training to customers' staff.

Rapid technological change means those working in this occupation must stay abreast of ever-changing product lines available on the market. Increasingly, these representatives will need to use electronic data banks to retrieve information for their customers. Many employers look for individuals with skills in Internet, word processing and spreadsheet software, as well as, having written and verbal communication and teamwork skills.

Characteristics of Occupation

Estimated Employment in 2000: 41,600

	(%)
Male	76
Female	24
Full-time	92
Part-time	8
Self-employed	7
Employees	93
Working away from home	77
Working at home	12
No fixed workplace address	11

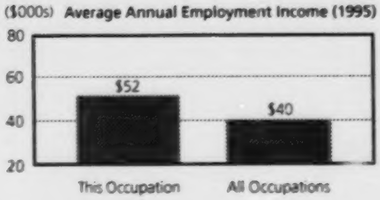
Employment by Region

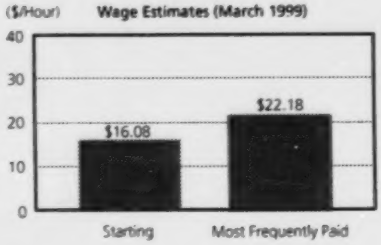
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	10	11
Toronto	58	42
London	4	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	1	3
Northeast	2	5
Northwest	1	2

Main Industries of Employment

	(%)
Wholesale trade	38
Manufacturing	28
Business service	18
Communication and other utilities	10

Income and Wages





For more information

Canadian Association of Equipment Distributors (www.caed.org)
Canadian Professional Sales Association (www.cpsa.com)
Canadian Office Products Association (www.copa.ca)

6231 Insurance Agents and Brokers

Description

Insurance agents and brokers sell automobile, fire, life, property, marine and other types of insurance to businesses and individuals. Insurance agents are employed by individual insurance companies to sell that company's products to clients. Insurance brokers are employed by brokerage firms and seek appropriate insurance products through several insurance companies on behalf of clients.

Common job titles: Insurance Agent; Insurance Broker; Insurance Sales Representative.

Typical employers: insurance companies; insurance and real estate agencies.

Selected Main Duties

Insurance agents and brokers perform some or all of the following duties:

- Sell automobile, fire, health, life, property, marine, aircraft and other types of insurance to clients;
- Establish client insurance coverage, calculate premiums and establish method of payment;
- Provide information concerning group and individual insurance packages, the range of risk coverage, benefits paid and other policy features;
- Ensure appropriate forms, medical examinations and other policy requirements are completed;
- Respond to clients' enquiries when claims are made.

Working environment: Members of this occupational group generally work in an office. Hours are usually self-determined and the nature of work often requires working evenings and weekends. Since most insurance agents are paid on a commission basis, earnings vary greatly and depend on the type of insurance sold, the company, location and sales volume.

Education/Training

Requirements include on-the-job training and completion of insurance industry-sponsored courses and training programs, and a license issued by the Superintendent of Insurance in the province or territory of employment. In Ontario, the self-regulating body for this occupation group is the Registered Insurance Brokers of Ontario.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to decline through 2005. However, because of the large size of this occupational group, the need to replace older retiring workers is expected to create a substantial number of job openings through 2005.

Expert systems will be used increasingly in the insurance industry and computerized telecommunications will link brokerages to insurance firms. Insurance agents and brokers will need to develop strong computer skills to exploit these technologies.

Characteristics of Occupation

Estimated Employment in 2000: 22,500

	(%)
Male	57
Female	43
Full-time	90
Part-time	10
Self-employed	9
Employees	91
Working away from home	84
Working at home	12
No fixed workplace address	4

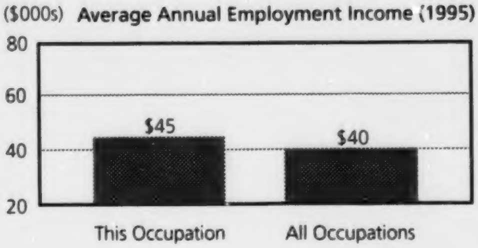
Employment by Region

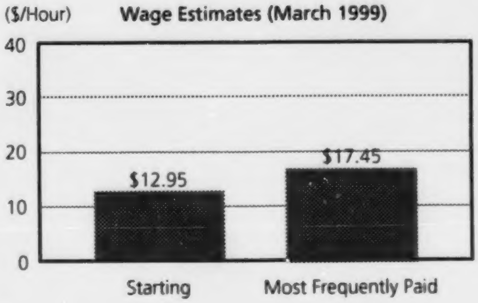
	(%) This Occupation	*(%) All Occupations*
Ottawa	11	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	11	11
Toronto	43	42
London	7	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	3	3
Northeast	5	5
Northwest	1	2

Main Industries of Employment

	(%)
Insurance and real estate agents	51
Insurance companies	43

Income and Wages





For more information

Canadian Association of Insurance and Financial Advisors (www.caifa.com)
Insurance Brokers Association of Ontario (www.ibao.org)
Insurance Brokers Association of Canada (www.ibac.ca)
Registered Insurance Brokers of Ontario (www.ribo.com)

6232 Real Estate Agents and Salespersons

Description

Real estate agents and salespersons act as agents for the sale or purchase of houses, apartments, commercial buildings, land and other real estate.

Common job titles: Commercial Real Estate Agent; Real Estate Agent; Real Estate Broker; Real Estate Sales Representative.

Typical employers: insurance and real estate agencies; operators of buildings and dwellings.

Selected Main Duties

Real estate agents and salespersons perform some or all of the following duties:

- Solicit property sales listings from prospective vendors;
- Assist vendors in selling property by establishing asking price, listing and advertising the property with multiple listing services and conducting open houses for prospective buyers;
- Assist prospective buyers in selecting, visiting, inspecting and making offers of purchase on real estate properties;
- Advise clients on market conditions, prices, mortgages, legal requirements and related matters;
- Draw up sales agreements for approval of purchaser and seller;
- Rent or lease properties on behalf of clients.

Working environment: Although real estate agents and salespersons base their operations in an office, much of their working time is spent outside of it. Displaying properties for sale, analysing properties, meeting with clients, researching and a wide variety of other tasks comprise much of the time outside the office. A workweek of more than 40 hours is quite common with work in the evenings and weekends to meet client needs. Real estate salespeople must hold a valid driver's license and have use of a reliable vehicle. They are normally paid a commission that can vary and is negotiated with the vendor at the time the listing is agreed upon.

Education/Training

Completion of a real estate training course is required. Provincial license in the province of employment is required. Real estate agents may operate independently by obtaining a broker's license in accordance with the regulations of the province of employment. A broker's license is required to become a manager in real estate. The Ontario Real Estate Association is the self-regulating body for this occupation group for Ontario.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to increase more slowly than the average for all occupations through 2005. Most job openings will occur from replacement needs as older workers retire.

Employment opportunities for this occupation are determined by economic conditions affecting the residential, commercial and industrial real estate sectors. The trend in this occupation is toward self-employment. Agents in most major firms now operate as independent contractors, paying the "home office" organization for office space, clerical services and the right to market under the firm's name.

Computer-based technologies are becoming increasingly common in the field. For example, laptop computers linked to the central office can be used to show properties to clients. Real estate agents and salespersons will need to develop the skills required by these technologies.

Characteristics of Occupation

Estimated Employment in 2000: 27,200

	(%)
Male	56
Female	44
Full-time	86
Part-time	14
Self-employed	15
Employees	85
Working away from home	78
Working at home	16
No fixed workplace address	6

Employment by Region

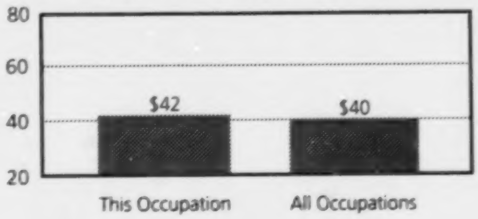
	(%) This Occupation	*(%) All Occupations*
Ottawa	6	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	9	11
Toronto	53	42
London	5	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	2	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

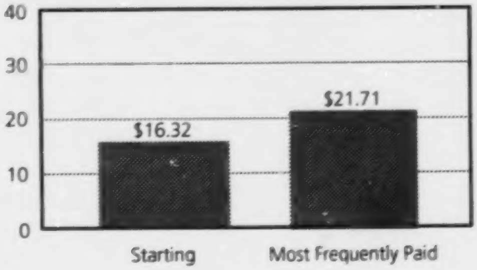
	(%)
Insurance and real estate agencies	92

Income and Wages

($000s) Average Annual Employment Income (1995)



($/Hour) Wage Estimates (March 1999)



For more information

Canadian Real Estate Association (realtors.mls.ca/crea)
Independent Real Estate Brokers Association of Canada (www.ireba.ca)
Real Estate Institute of Canada (www.reic.ca)
Ontario Real Estate Association (www.orea.com)

6233 Retail and Wholesale Buyers

Description

Retail and wholesale buyers buy merchandise for resale by retail and wholesale establishments and are usually responsible for the merchandising operations of retail establishments. They may specialize in a particular merchandise line.

Common job titles: Appliance Buyer; Chief Buyer; Food Buyer; Produce Buyer.

Typical employers: general merchandise stores; food stores; food wholesalers; prescription drug stores; waste materials wholesalers; women's, men's and children's clothing stores; electrical and electronic machinery and equipment wholesalers.

Selected Main Duties

Retail and wholesale buyers perform some or all of the following duties:

- Purchase merchandise for resale by retail or wholesale establishments;
- Review requirements of establishments and determine quantity and type of merchandise to purchase;
- Study market reports, trade periodicals and sales promotion materials and visit trade shows, showrooms, factories and product design events;
- Select the merchandise which best fits the establishment's requirements;
- Interview suppliers and negotiate prices, discounts, credit terms and transportation arrangements;
- Oversee distribution of merchandise to outlets and maintain adequate stock levels;
- Establish and maintain contact with suppliers;
- Supervise the work of other retail buyers.

Working environment: Buyers work in offices situated in stores or in corporate headquarters. A busy work schedule may require extra hours or weekend work. The highly competitive nature of the industry means buyers operate under pressure. Substantial travelling is often required.

Education/Training

The type of post-secondary education program pursued by members of this occupational group will depend partly on the nature of the retail or wholesale goods sold. Employment in this area requires a combination of education, experience or other attributes. Besides completion of secondary school, a university degree or college diploma in business, marketing or a related program is usually required. Retail and wholesale buyers may specialize through experience or product-related training courses.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Advances in computerized inventory systems will continue to affect employment opportunities and skills needed by these workers. Inventories can now be tracked at the checkout counter and restocked automatically as is currently done in most large consumer outlets. Computerized ordering systems are also used to place orders with their suppliers. Buyers will need to develop the appropriate computer skills.

With the advent of e-commerce, buyers will also need to develop the skills and knowledge for effectively using this source of information and placing of orders for variety of goods on-line.

Characteristics of Occupation

Estimated Employment in 2000: 13,600

	(%)
Male	51
Female	49
Full-time	86
Part-time	14
Self-employed	7
Employees	93
Working away from home	89
Working at home	4
No fixed workplace address	7

Employment by Region

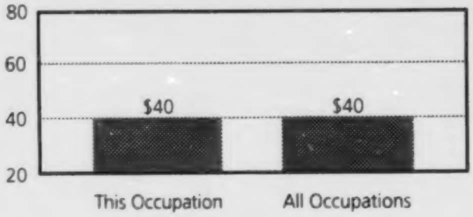
	(%) This Occupation	*(%) All Occupations*
Ottawa	7	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	10	11
Toronto	59	42
London	4	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	2	3
Northeast	2	5
Northwest	1	2

Main Industries of Employment

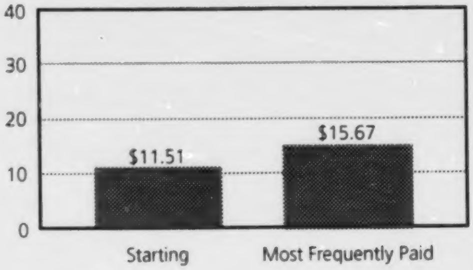
	(%)
Retail trade	47
Wholesale trade	27
Manufacturing	14

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Purchasing Management Association of Canada (www.pmac.ca)
Retail Council of Canada (www.retailcouncil.org)
The Canadian Federation of Independent Grocers (www.cfig.ca)

6241 Chefs

Description

This group includes various types of chefs who plan and direct food preparation and cooking activities and who prepare and cook meals and speciality foods.

Common job titles: Chef; Chef de Cuisine; Executive Chef; Pastry Chef; Specialist Chef; Sous-Chef; Head Chef; Corporate Chef; Executive Sous-Chef.

Typical employers: food services; hotels, motels and tourist courts; sports and recreation clubs; food stores; restaurants; hospitals and other health care institutions.

Selected Main Duties

Executive chefs perform some or all of the following duties:

- Plan and direct food preparation and cooking activities of several restaurants in an establishment, restaurant chains, hospitals or other establishments with food services;
- Plan menus and ensure food meets quality standards;
- Estimate food requirements and may estimate food and labour costs;
- Supervise activities of sous-chefs, specialist chefs and other chefs and cooks;
- Recruit and hire staff;
- Prepare and cook food on a regular basis or for special guests or functions.

Sous-chefs perform some or all of the following duties:

- Supervise activities of chefs, specialist chefs, cooks and other kitchen workers;
- Demonstrate new cooking techniques and new equipment to cooking staff;
- Plan menus and requisition food and kitchen supplies;
- Prepare and cook meals or speciality foods.

Chefs and *specialist chefs* perform some or all of the following duties:

- Prepare and cook complete meals, banquets or speciality foods, such as pastries, sauces, soups, salads, vegetables and meat, poultry and fish dishes, and create decorative food displays;
- Instruct cooks in preparation, cooking, garnishing and presentation of food;
- Supervise cooks and other kitchen staff;
- Plan menus;
- Requisition food and kitchen supplies.

Pâtissiers prepare ingredients and bake bread, cakes, cookies, pies and speciality items.

Working environment: Chefs work with specialized food preparers and cook food under time constraints. Chefs of all kinds may work long hours, especially if they own their own businesses. Pay varies according to the establishment and experience. Shift work, possible split shifts and weekend work are often required.

Education/Training

Employment in this area may require a combination of education, experience or other attributes. Completion of secondary school is usually required. Completion of an apprenticeship program, formal training abroad, or equivalent training and experience are required. Interprovincial trade certification (Red Seal) is also available to qualified chefs. There is some mobility among the various types of chefs. Executive chefs must have managerial skills and may progress to senior managerial positions in food preparation establishments.

In Ontario, cook's trade certification is available but not mandatory. It does, however, indicate a certain level of achievement and is required by some employers. This may be a first step in a career path towards becoming a chef.

Employment Prospects

Over the next five years: Strong

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. Job seekers with the appropriate skills and qualifications can expect good job prospects, as employers across Ontario report difficulties in finding qualified workers to fill vacant positions.

Employment in this occupational group is concentrated in the accommodation and food industries, which are sensitive to general economic conditions as well as subject to seasonal variations, especially in resort areas. According to the Canadian Federation of Chefs and Cooks, the best trained chefs and cooks are in high demand. As well, more travel by Ontarians and a more multicultural society have increased the demand for chefs specializing in foreign cuisine.

Changing technology in the workplace, such as microwave cooking, adds to the complexity of a chef's job. As well, increasing computerization in kitchens – for example retrieval and inventory control – will require that these workers have appropriate skills.

Characteristics of Occupation

Estimated Employment in 2000: 12,600

	(%)
Male	81
Female	19
Full-time	89
Part-time	11
Self-employed	4
Employees	96
Working away from home	97
Working at home	2
No fixed workplace address	1

Employment by Region

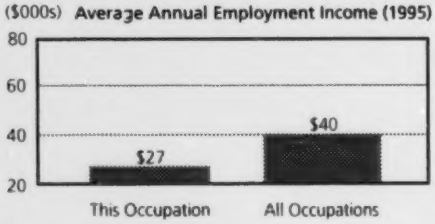
	(%) This Occupation	*(%) All Occupations*
Ottawa	11	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	8	11
Toronto	55	42
London	4	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	2	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

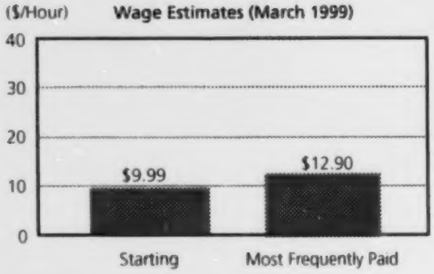
	(%)
Food and beverage service	71
Accommodation service	11

Income and Wages

Average Annual Employment Income (1995)



Wage Estimates (March 1999)



For more information

Canadian Federation of Chefs and Cooks (www.cfcc.ca)

Canadian Restaurant and Foodservices Association (www.crfa.ca)

Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/service.html)

6242 Cooks

Description

Cooks prepare and cook a wide variety of foods. They may specialize in preparing and cooking ethnic cuisine or special dishes.

Common job titles: Apprentice Cook; Dietary Cook; First Cook; Grill Cook; Institutional Cook; Short-Order Cook.

Typical employers: restaurants; food services; institutional health and social services firms; hotels, motels and tourist courts; hospitals; educational institutions.

Selected Main Duties

Cooks perform some or all of the following duties:

- Prepare and cook complete meals or individual dishes and foods;
- Prepare and cook special meals for patients as instructed by dietician or chef;
- Supervise kitchen helpers;
- Oversee subordinate personnel in preparation, cooking and handling of food;
- Plan menus, determine size of food portions, estimate food requirements and costs, and monitor and order supplies.

Working environment: Cooks work with specialized food preparers and cook food under time constraints. Cooks work days, evenings and weekends, including holidays. The hours of work may be quite long although many work on a part-time basis.

Education/Training

Employment in this area may require a combination of education, experience or other attributes. Completion of secondary school is usually required. Completion of an apprenticeship program for cooks or completion of college or other program in cooking or several years of commercial cooking experience are required. Trade certification is available in most provinces. Interprovincial trade certification (Red Seal) is also available to qualified cooks. This is a voluntary trade. Persons can obtain a certificate of qualification though the certificate is not mandatory. The certificate, however, does indicate a certain level of achievement and is required by some employers.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Many job openings will be created each year from the need to replace workers who retire.

Employment in this occupational group is concentrated in the accommodation and food industries, which are sensitive to general economic conditions as well as subject to seasonal variations, especially in resort areas. According to the Canadian Federation of Chefs and Cooks, the best trained chefs and cooks are in high demand.

Changing technology in the workplace, such as microwave cooking, changes the nature of a chef's job. As well, increasing computerization in kitchens – for example, retrieval and inventory control – will require that these workers have appropriate skills.

Characteristics of Occupation

Estimated Employment in 2000: 49,700

	(%)
Male	56
Female	44
Full-time	60
Part-time	40
Self-employed	4
Employees	96
Working away from home	96
Working at home	2
No fixed workplace address	2

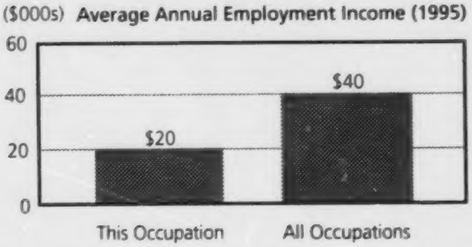
Employment by Region

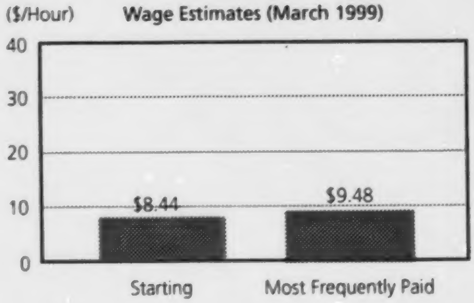
	(%) This Occupation	*(%) All Occupations*
Ottawa	11	10
Kingston-Pembroke	5	4
Muskoka-Kawarthas	4	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	11	11
Toronto	35	42
London	5	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	3	3
Northeast	8	5
Northwest	3	2

Main Industries of Employment

	(%)
Food and beverage service	78
Health and social service	9

Income and Wages





For more information

Canadian Federation of Chefs and Cooks (www.cfcc.ca)
Canadian Restaurant and Foodservices Association (www.crfa.ca)
Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/service.html)

6251 Butchers and Meat Cutters, Retail and Wholesale

Description

Butchers and meat cutters prepare standard cuts of meat, poultry, fish and shellfish for sale in retail or wholesale food establishments.

Common job titles: Butcher – Retail and Wholesale; Butcher Apprentice; Head Butcher – Retail and Wholesale; Supermarket Meat Cutter.

Typical employers: food stores; meat and poultry product companies; food wholesalers; butcher shops; fish stores; self-employment.

Selected Main Duties

Butchers and meat cutters in this group perform some or all of the following duties:

- Cut, trim and otherwise prepare standard cuts of meat, poultry, fish and shellfish for sale at self-serve counters or according to customers' orders;
- Grind meats and slice cooked meats using powered grinders and slicing machines;
- Prepare special displays of meat, poultry, fish and shellfish;
- Shape, lace and tie roasts and other meats, poultry or fish and may wrap prepared meats, poultry, fish and shellfish;
- Supervise other butchers or meat cutters.

Working environment: Working conditions are highly dependent on the scale and nature of operations. Larger meat cutting operations use highly technical machinery that pose unique dangers to the user. Smaller butchers still use manual knives and tools, which offer quite a different type of danger in protecting hands from accidental injury. Health and safety regulations require butchers to maintain a clean, sanitary work environment. Refrigeration of the work area is also very common. The work is repetitive in nature. Butchers and meat cutters normally work 40 hours per week. Evening work may be a mandatory part of the job.

Education/Training

Employment in this area may require a combination of education, experience or other attributes. Completion of secondary school may be required. Completion of a college or other program in meat cutting may be required. On-the-job training in food stores is usually provided for retail butchers and meat cutters. Apprenticeship training in retail meat cutting is available in Ontario.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through 2005.

The growing trend towards "ready-to-heat" meat products will provide some employment opportunities for semi-skilled meat, poultry and seafood cutters. This trend reflects a continuing shift of meat cutting and processing from the retail store to the food processing plant.

Characteristics of Occupation

Estimated Employment in 2000: 5,900

	(%)
Male	78
Female	22
Full-time	68
Part-time	32
Self-employed	3
Employees	97
Working away from home	98
Working at home	1
No fixed workplace address	1

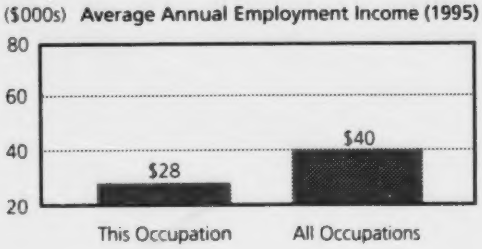
Employment by Region

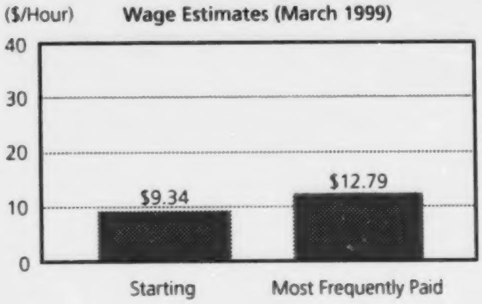
	(%) This Occupation	*(%) All Occupations*
Ottawa	11	10
Kingston-Pembroke	5	4
Muskoka-Kawarthas	4	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	13	11
Toronto	34	42
London	5	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	4	3
Northeast	8	5
Northwest	2	2

Main Industries of Employment

	(%)
Food stores	93

Income and Wages





For more information

Canadian Federation of Agriculture (www.cfa-fca.ca)
Canadian Federation of Independent Grocers (www.cfig.ca)
Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/service.html)
Canadian Meat Science Association (cmsa.ca)

6252 Bakers

Description

Bakers prepare bread, rolls, muffins, pies and cakes for sale in retail food establishments or for serving in restaurants and other establishments.

Common job titles: Baker; Head Baker; Bakery Supervisor; Baker Apprentice.

Typical employers: food stores; food services; bakeries; food wholesalers; hotels; restaurants; self-employment.

Selected Main Duties

Bakers perform some or all of the following duties:

- Prepare dough for pies, bread and rolls, and sweet goods, and prepare batters for muffins, cookies, cakes, icings and frostings according to recipes or special customer orders;
- Bake mixed doughs and batters;
- Frost and decorate cakes or other baked goods;
- Draw up production schedule to determine type and quantity of goods to produce;
- Purchase baking supplies;
- Hire and train baking personnel;
- Oversee sales and merchandising of baked goods;
- Clean utensils and machinery used in baking.

Working environment: In large bakeries, operations have been streamlined by using machinery whereby each worker performs only selected tasks. In medium-sized bakeries, some functions are performed by hand rather than machine, while in small bakeries, the baker performs all required tasks. Bakers lift heavy loads, carry and push containers and stand or walk for long periods. Working with flour or sugar can have adverse affects on the respiratory system and skin. Five-day week is becoming the norm, though hours remain irregular as many bakers start their daily shifts at 5 AM. Those working at large bakeries may have to work at night. Except for specific holidays and slight decline in activity from January to March, there is little seasonal variation in work. Bakers in their own businesses may work particularly long hours.

Education/Training

Employment in this area may require a combination of education, experience or other attributes. Completion of secondary school is usually required. Completion of a three or four-year apprenticeship program for bakers or completion of a college or other program for bakers is usually required. On-the-job training may be provided. Apprenticeship training programs are also available although this is a voluntary trade. Red Seal trade certification allows for inter-provincial mobility.

Experienced bakers may advance to supervisory positions or start their own businesses. With additional training, bakers can transfer their skills to related occupations such as cook, pastry cook, cake decorator, baking instructor or supply-company salesperson.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. As a result of the large size of this occupational group, the need to replace bakers who retire will produce many job openings yearly.

Bakers are employed in food processing firms, restaurants, hotels, pastry shops and catering companies, all of which are somewhat dependent upon the economy. There is a trend for many hotels and restaurants to contract out their baking to a growing number of specialized firms. Bakeries in supermarkets have become widespread. Demand is also high for personalized service in fresh bread shops and bakery cafes, which offer speciality products such as breads without food additives. The mass production end of the baking industry is characterized by the trend towards products that are produced using high-tech equipment.

Frequently, employers look for bakers who have completed an apprenticeship program.

Characteristics of Occupation

Estimated Employment in 2000: 16,300

	(%)
Male	48
Female	52
Full-time	66
Part-time	34
Self-employed	6
Employees	94
Working away from home	95
Working at home	3
No fixed workplace address	2

Employment by Region

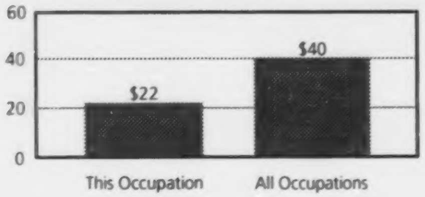
	(%) This Occupation	*(%) All Occupations*
Ottawa	7	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	13	11
Toronto	42	42
London	5	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	3	3
Northeast	5	5
Northwest	2	2

Main Industries of Employment

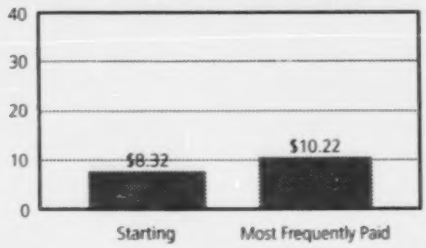
	(%)
Food stores	55
Food and beverage service	28

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/service.html)
Mr. Pastry (tor-pw1.attcanada.ca/~mrpastry)
Baking Association of Canada (www.baking.ca)

6271 Hairstylists and Barbers

Description

Hairstylists and barbers cut and style hair and perform related services.

Common job titles: Barber; Barber Apprentice; Hairdresser; Hairstylist Apprentice; Wig Stylist; Hair Colour Technician; Hairdresser Apprentice.

Typical employers: barber shops; hairstyling and hairdressing salons; theatre, film and television establishments; vocational schools; self-employment.

Selected Main Duties

Hairstylists perform some or all of the following duties:

- Suggest hair style compatible with client's physical features or determine style from client's instructions and preferences;
- Shampoo and rinse hair;
- Cut, trim, taper, curl, wave, perm and style hair;
- Apply bleach, tint, dye or rinses to colour, frost or streak hair;
- Analyse hair and scalp condition and provide basic treatment or advice on beauty care treatments for scalp and hair;
- Train or supervise other hairstylists, hairdressers and assistants.

Barbers perform some or all of the following duties:

- Cut and trim hair according to client's instructions or preferences;
- Shave and trim beards and moustaches;
- Shampoo hair and provide other hair treatment, such as waving, straightening and tinting and may also provide scalp-conditioning massages.

Working environment: Hairstylists may work in salons that cater to either or both men and women. Good physical stamina is required as these workers are on their feet for long periods. There is exposure to chemicals. There are many beauty treatments, perms and colours available so the job can offer variety and challenge. For many practitioners, one big appeal of this trade is the possibility of opening a shop of their own. The hours of work can be long, especially as an owner, and hairstylists generally work weekends and some evenings. Rates of pay vary; accomplished hairstylists working for prestigious shops can receive substantial wages. However, part-time work is plentiful and the majority of workers are paid a commission, a commission plus an hourly rate or rent a chair from the owners.

Education/Training

Employment in this area may require a combination of education, experience or other attributes. Hairstylists may require some secondary school education and completion of a two to three-year hairstyling apprenticeship program or completion of a college or other program in hairstyling combined with on-the-job training. For barbers, in addition to some secondary school education, completion of a two-year apprenticeship or other barber program is usually required. Educational standards are becoming more important in this occupation as the range of services expands.

In Ontario, a certificate of qualification, gained through apprenticeship and/or examination, is mandatory for this trade.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow more rapidly than the average for all occupations through the year 2005 due to growth in population and incomes. Replacement needs are expected to create a substantial number of job openings yearly due to the rapid turnover and the large size of this occupational group.

Some salons hire only experienced workers who can also bring with them an established clientele. The larger salons (e.g., in shopping centres) tend not to have such requirements. There is a growing practice in established beauty salons of renting out chairs to hairstylists, who in effect become self-employed. There is also a trend for workers to leave salons to work out of their own home or clients' premises.

Characteristics of Occupation

Estimated Employment in 2000: 32,300

	(%)
Male	23
Female	77
Full-time	71
Part-time	29
Self-employed	32
Employees	68
Working away from home	87
Working at home	11
No fixed workplace address	2

Employment by Region

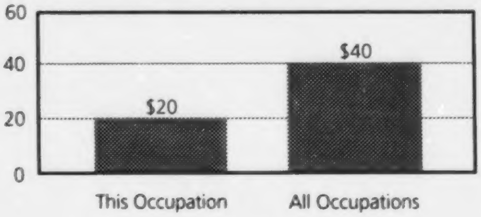
	(%) This Occupation	*(%) All Occupations*
Ottawa	11	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	13	11
Toronto	38	42
London	6	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	3	3
Northeast	6	5
Northwest	2	2

Main Industries of Employment

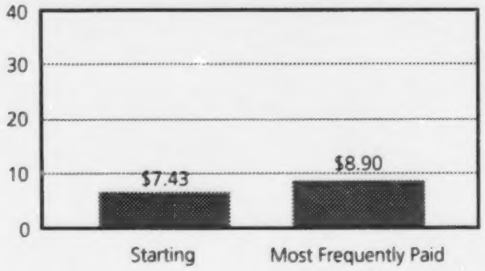
	(%)
Personal and household service	98

Income and Wages

($000s) Average Annual Employment Income (1995)



($/Hour) Wage Estimates (March 1999)



For more information

Allied Beauty Association (www.abacanada.com)

Canadian Cosmetic, Toiletry and Fragrance Association (www.cctfa.ca)

Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/service.html)

Marvel Schools (www.marvelschools.com)

6421 Retail Salespersons and Sales Clerks

Description

Retail salespersons and sales clerks sell or rent a range of goods and services in stores and other retail businesses and in wholesale businesses that sell on a retail basis to the general public.

Common job titles: Automobile Salesperson; Car Rental Agent; Counter Clerk; Furniture Salesperson; Jewellery Salesperson; Retail Sales Clerk; Clothing Salesperson.

Typical employers: general merchandise stores; food stores; automobile dealers; clothing stores; hardware stores; prescription drug stores; hobby and novelty stores.

Selected Main Duties

Retail salespersons and sales clerks perform some or all of the following duties:

- Greet customers and discuss the type, quality and quantity of merchandise sought for purchase or rental;
- Advise customers on use and care of merchandise;
- Estimate or quote prices, credit terms, trade-in allowances, warranties and delivery dates;
- Prepare merchandise for purchase or rental;
- Prepare sales contracts and accept cash, cheque, credit card or automatic debit payment;
- Assist in the display of merchandise;
- Maintain sales records for inventory control.

Working environment: In keeping with customer shopping patterns, sales clerks usually work some evenings, Saturdays and Sundays. Part-time work is frequent in this occupation. Work can be seasonal with employment peaking prior to Christmas. Some clerks earn bonuses or commissions in addition to base salary. Wages and benefits tend to vary depending upon the type and size of employing establishment. However, many retail salespersons can buy their store's merchandise at a discount.

Education/Training

Entrance into this occupational group usually requires secondary school graduation. Some knowledge about the product or service being sold may also be required.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005 due to anticipated growth in retail sales created by a growing population. Many job openings will be created each year from the need to replace the large number of workers who retire.

This occupational group provides labour market entrants with their first experience of paid employment. There will continue to be many opportunities for part-time workers and demand will be strong for temporary workers during peak selling periods, such as the Christmas season. As well, many workers are not long-term employees; rather they see retail sales as a stepping stone to alternative, higher paying careers. Consequently, worker turnover is high which give rise to employment opportunities for new entrants.

Point-of-sale data entry and computerized scanning systems are increasingly used in the retail sector. Sales personnel need to be familiar with these technologies. E-commerce may impact the need for retail salespersons over the longer term, transforming some of the retail jobs into telecentre sales support.

Characteristics of Occupation

Estimated Employment in 2000: 223,500

	(%)
Male	38
Female	62
Full-time	50
Part-time	50
Self-employed	5
Employees	95
Working away from home	93
Working at home	4
No fixed workplace address	3

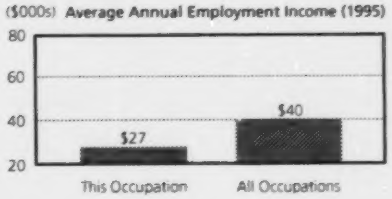
Employment by Region

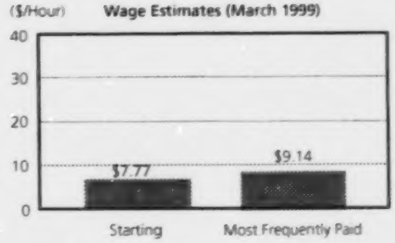
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	12	11
Toronto	42	42
London	6	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	3	3
Northeast	6	5
Northwest	2	2

Main Industries of Employment

	(%)
Other retail stores	22
Shoe stores	16
General retail merchandise	14
Food stores	13
Wholesale trade	7

Income and Wages





For more information

Canadian Professional Sales Association (www.cpsa.com)
Direct Sellers Association (www.dsa.ca)

6431 Travel Counsellors

Description

Travel counsellors advise clients on travel options and tour packages, make bookings and reservations, prepare tickets and receive payment.

Common job titles: Travel Agent; Travel Consultant; Travel Counsellor.

Typical employers: travel agencies; transportation and tourism firms, hotel chains.

Selected Main Duties

Travel counsellors perform some or all of the following duties:

- Provide travel information to clients regarding destinations, transportation and accommodation options and travel costs;
- Plan and organize vacation travel for individuals or groups;
- Make transportation and accommodation reservations using computerized reservation and ticketing system;
- Sell single fare tickets and package tours to clients;
- Promote particular destinations, tour packages and other travel services;
- Provide travel tips regarding tourist attractions, foreign currency, customs, languages and travel safety.

Working environment: Some overtime work during evenings, weekends and during peak travel periods may be required. Hours can also vary especially during peak travel periods. Individuals working as travel counsellors must be prepared to work under pressure.

Education/Training

Employment in this area may require a combination of education, experience or other attributes. Completion of secondary school is required. A college diploma or vocational training in travel or tourism is usually required. Certification with the Canadian Institutes of Travel Counsellors may be required. A Certified Travel Counsellor designation is granted after three years of work experience in the industry and the completion of mandatory courses and examinations. In addition to industry educational programs, post-secondary college studies may be necessary for entrance into this classification. The extensive use of computerized reservation systems, booking systems and retrieval of information on destinations using the Internet requires that persons in these occupations develop the appropriate skills.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through the year 2005. Many job openings will occur each year as experienced agents retire. Demand for travel services will increase because more people will travel on vacation resulting from rising family incomes, smaller families and an increasing number of older people who are more likely to travel. Business-related travel should also grow as business activity expands.

Advances in computer technology are impacting on employment opportunities for this occupation. "One-Stop" electronic systems, which integrate numerous travel services, now allow payment for transportation, lodging and car rentals to be made at one location. In addition, new communications systems are allowing consumers to arrange "on-line", over the Internet, many aspects of a typical travel package. Travel agencies, however, will continue to position themselves to meet the unique needs of niche markets by developing services to appeal to senior citizens, remote destination travellers, families and other groups willing to pay for specialized assistance.

Characteristics of Occupation

Estimated Employment in 2000: 10,600

	(%)
Male	21
Female	79
Full-time	78
Part-time	22
Self-employed	5
Employees	95
Working away from home	92
Working at home	6
No fixed workplace address	2

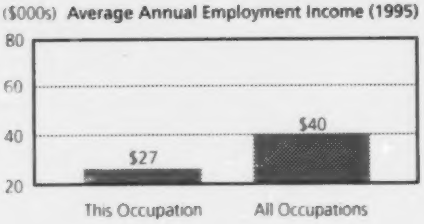
Employment by Region

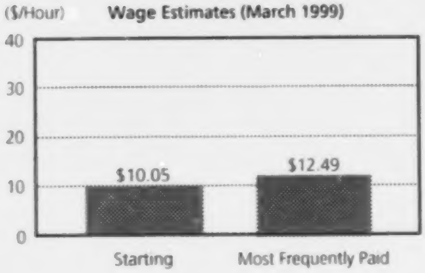
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	5	9
Hamilton-Niagara Peninsula	10	11
Toronto	57	42
London	4	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	2	3
Northeast	3	5
Northwest	2	2

Main Industries of Employment

	(%)
Other service	93

Income and Wages





For more information

Association of Canadian Travel Agents (www.acta.net)
Canadian Tourism Commission (www.canadatourism.com)
Association of Retail Travel Agents (www.artaonline.com)
Canadian Institute of Travel Counsellors (www.citc.ca)

6453 Food and Beverage Servers

Description

Food and beverage servers take patrons' food and beverage orders and serve orders to patrons.

Common job titles: Banquet Server; Captain Waiter/Waitress; Chief Wine Steward; Waiter/Waitress.

Typical employers: food services; hotels, motels and tourist courts; taverns, bars and night clubs; sports and recreation clubs.

Selected Main Duties

Food and beverage servers perform some or all of the following duties:

- Greet patrons, present menus, make recommendations and answer questions regarding food and beverages;
- Take orders and relay to kitchen and bar staff;
- Recommend wines that complement patrons' meals;
- Serve food and beverages;
- Prepare and serve specialty foods at patrons' tables;
- Present bill to patrons and accept payment.

Working environment: Typically, persons in this occupation work indoors in shifts. Hours are varied and include days, evenings and weekends, Monday to Sunday. Waiters and waitresses are continuously on their feet and the pace of work may become hectic during mealtime peaks. Through it all, they must deal quickly but pleasantly with all manners of customers. The incidence of part-time work is high. Workers supplement their incomes with tips and gratuities that are often 10 to 15% of the food bill. There are strong seasonal requirements for this occupation, particularly in resort areas of the province.

Education/Training

Employment in this area may require a combination of education, experience or other attributes. Completion of secondary school may be required. Formal waiters and waitresses may require completion of college or vocational school courses. On-the-job training is usually provided. Wine stewards may require courses in wine selection and service or experience as a captain waiter or waitress or formal waiter or waitress.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005.

Most of the jobs in this occupation are part-time. Employment is also somewhat seasonal with its peak occurring during the summer months. As well, many workers are not long-term employees; rather, they see this position as a stepping stone to alternative, higher paying careers. Consequently, worker turnover is high, and employment opportunities tend to be more plentiful than in other occupations.

Increased use of computerized ordering and billing systems will reduce this component of these workers' jobs, increasing the time available to devote to providing service.

Characteristics of Occupation

Estimated Employment in 2000: 63,500

	(%)
Male	21
Female	79
Full-time	40
Part-time	60
Self-employed	1
Employees	99
Working away from home	98
Working at home	0
No fixed workplace address	2

Employment by Region

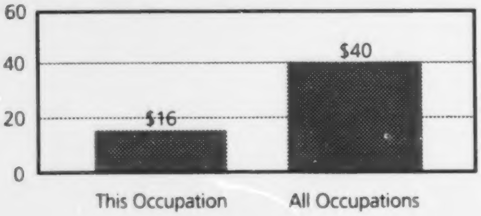
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	12	11
Toronto	36	42
London	5	5
Windsor-Sarnia	7	5
Stratford-Bruce Peninsula	3	3
Northeast	7	5
Northwest	3	2

Main Industries of Employment

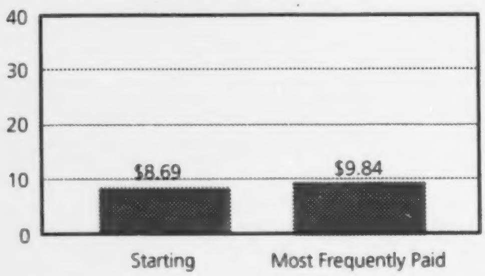
	(%)
Food and beverage service	84
Accommodation service	8

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Canadian Tourism Human Resource Council (www.cthrc.ca)
Canadian Restaurant and Foodservices Association (www.crfa.ca)
National Licensed Beverage Association (www.nlba.org)

6470 Early Childhood Educators and Assistants

Description

Early childhood educators plan and organize activities for preschool children and lead children in these activities to encourage their intellectual, physical and emotional growth. Early childhood educator assistants supervise preschool children in day care centres and nursery schools and, under the supervision of an early childhood educator, they lead children in activities to stimulate and develop their intellectual, physical and emotional growth.

Common job titles: Child Care Worker; Day Care Worker; Day Care Supervisor; Early Childhood Program Staff; Preschool Teacher; Child Care Worker Assistant; Day Care Helper; Early Childhood Educator Assistant; Preschool Helper.

Typical employers: non-institutional social services organizations; elementary schools; personal and household service firms; municipal governments; private households.

Selected Main Duties

Early childhood educators perform some or all of the following duties:

- Develop daily activities for children;
- Lead children in activities by telling or reading stories, teaching songs, preparing craft materials and demonstrating their use and taking the children to local points of interest;
- Guide and assist children in the development of proper eating, dressing and toilet habits;
- Observe children for signs of learning disabilities or emotional problems;
- Discuss progress or problems of children with parents and other staff members;
- Attend meetings and workshops to develop and discuss new teaching methods;
- Supervise and co-ordinate the activities of other early childhood educators and early childhood educator assistants.

Early childhood educator assistants perform some or all of the following duties:

- Supervise children in indoor and outdoor play and during rest period;
- Lead children in activities by telling stories, teaching songs and preparing craft materials;
- Prepare and serve snacks;
- Guide and assist children in the development of proper eating, dressing and toilet habits;
- Submit written observations on children to supervisor;
- Attend staff meetings to discuss progress and problems of children;
- Assist supervisor in keeping records;
- Maintain day care equipment and assist in housekeeping duties.

Working environment: The work environment of an educator of younger children is often a hectic one. Besides curriculum, the need to maintain order and to foster a positive social and educational environment is paramount. Part-time work also plays a role in the employment patterns of this occupational group since most licensed day care establishments are staffed for more than 8 hours per day.

Education/Training

Nursery schools and day care centres are regulated by the Ministry of Community and Social Services in Ontario. A bachelor's degree or college diploma in early childhood education or a bachelor's degree in education is required for licensing. Progression to senior positions, such as day care supervisor, is possible with experience. Supervisors or directors require two years experience in addition to the educational requirement.

Early childhood educators are regulated by an approval procedure through the Ministry of Community and Social Services and a credentialing procedure through the Association of Early Childhood Education, Ontario.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow more rapidly than the average for all occupations through the year 2005. Job prospects in this occupation are somewhat dependent upon public support of child care, the provision of pre-kindergarten schooling and whether early childhood educators or teachers teach kindergarten and pre-kindergarten children.

This occupational group consists of a relatively young workforce, reflecting the entry-level character of jobs and relatively low salary levels in this industry.

Characteristics of Occupation

Estimated Employment in 2000: 44,000

	(%)
Male	4
Female	96
Full-time	67
Part-time	33
Self-employed	14
Employees	86
Working away from home	77
Working at home	21
No fixed workplace address	2

Employment by Region

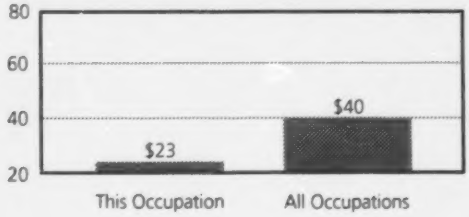
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	9	11
Toronto	48	42
London	6	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	2	3
Northeast	5	5
Northwest	2	2

Main Industries of Employment

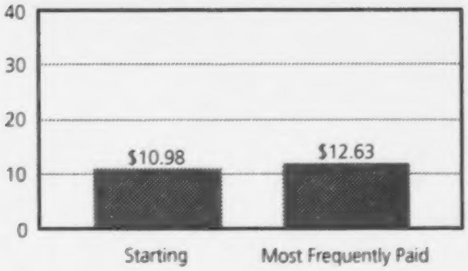
	(%)
Health and social service	86

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Association of Early Childhood Educators, Ontario (www.cfc-efc.ca/aeceo)
Canadian Association of Family Resource Programs (www.frp.ca)
Ministry of Community and Social Services (www.gov.on.ca/CSS)

6471 Visiting Homemakers, Housekeepers and Related Occupations

Description

Visiting homemakers, housekeepers and related occupation workers provide ongoing or short-term home support services for individuals and families during periods of incapacitation, convalescence or family disruption.

Common job titles: Companion; Foster Parent; Home-Health Aide; Personal Aide; Housekeeper; Home Support Worker; Visiting Homemaker.

Typical employers: non-institutional social service organizations; institutional health and social services firms; private households; health and social service associations and agencies; non-institutional health services; offices of health practitioners; hospitals; services firms; municipal governments.

Selected Main Duties

Visiting homemakers perform some or all of the following duties:

- Care for individuals and families during periods of incapacitation, convalescence or family disruption;
- Administer bedside and personal care to clients such as aid in ambulation, bathing and personal hygiene, under the general direction of home care agency supervisor or nurse;
- Plan and prepare meals and special diets;
- Demonstrate infant care to new parents;
- Perform routine housekeeping duties such as laundry, washing dishes and making beds.

Housekeepers perform some or all of the following duties:

- Perform housekeeping and other home management duties under general direction of employer;
- Plan and prepare meals independently or with employer, and may serve meals;
- May care for children.

Companions perform some or all of the following duties:

- Provide elderly and convalescent clients with companionship and personal care in client's home under general direction of home care agency supervisor or family members;
- Aid clients with ambulation, bathing, and other aspects of personal hygiene.

Foster parents perform some or all of the following duties:

- Care for foster children, usually on an emergency or temporary basis, as family members under general direction of foster parent agency;
- Consult foster parent agency supervisors for advice and when problems arise;
- Administer therapeutic programs for foster children, as directed by foster agency social workers.

Working environment: Visiting homemakers, housekeepers and others in this occupation may have a varying routine. Some visit the same household for months or even years, while more commonly, many work with different clients. The nature of the home will determine the work environment. Unsupervised work is the norm. Weekend and evening employment is common and hours vary from employer to employer.

Education/Training

Some secondary school education may be required. Childcare or home management experience may be required. Visiting homemakers may require college or other courses in home support. First-aid certification may also be required.

Employment Prospects

Over the next five years: Good

Economic growth and replacement needs are expected to create a substantial number of job openings through 2005. An ageing population will increase the demand for home-care workers. Additional employment opportunities may also result from the restructuring of health services and a continuing trend to maintain people in the community as long as possible.

Changes, which may affect the essential skills used by homemaker service workers in the future, include focusing more on personal and medical care rather than on cleaning. This will mean that some workers will need to update their personal care qualifications.

Characteristics of Occupation

Estimated Employment in 2000: 27,100

	(%)
Male	7
Female	93
Full-time	44
Part-time	56
Self-employed	4
Employees	96
Working away from home	57
Working at home	6
No fixed workplace address	37

Employment by Region

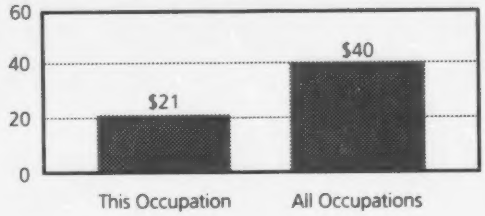
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	5	4
Muskoka-Kawarthas	5	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	13	11
Toronto	29	42
London	7	5
Windsor-Sarnia	8	5
Stratford-Bruce Peninsula	5	3
Northeast	7	5
Northwest	4	2

Main Industries of Employment

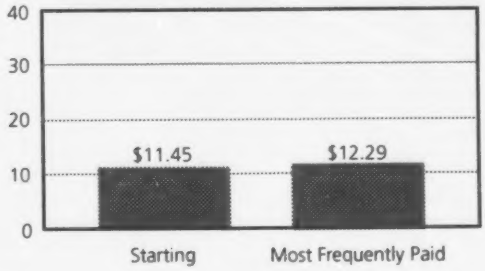
	(%)
Health and social service	81
Other service	10

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

VHA Home Healthcare (www.vha.on.ca)

Canadian Palliative Care Association (www.cpca.net)

6472 Elementary and Secondary School Teacher Assistants

Description

Workers in this group include those who assist elementary and secondary school teachers and counsellors. They are employed in publicly funded and private elementary and secondary schools.

Common job titles: Educational Resources Assistant; Lunchroom Supervisor; Teacher's Aide; Teacher's Assistant.

Typical employers: elementary and secondary schools; non-institutional social services.

Selected Main Duties

Elementary and secondary school teacher assistants perform some or all of the following duties:

- Assist students with lessons under direct supervision of classroom teacher;
- Accompany and supervise students during activities in school gymnasiums, laboratories, libraries, resource centres and on field trips;
- Assist special needs students, such as those with mental or physical disabilities, with mobility, communication and personal hygiene;
- Operate or assist teacher in operation of projectors, tape recorders and other audio-visual or electronic equipment;
- Carry out behaviour modification, personal development and other therapeutic programs under supervision of professionals such as special education instructors, psychologists or speech-language pathologists;
- Monitor students during recess or noon hour;
- Assist in school library or office and perform other duties assigned by a school principal.

Working environment: Many teacher assistants work full- or part-time during the school year under a contract. A classroom setting dominates activities, though outdoor recess duty is possible. The work can be both physically and mentally demanding.

Education/Training

Employment in this area may require a combination of education, experience or other attributes. Completion of secondary school is usually required. College courses in child care or related fields may be required for some positions. Teacher assistants who aid students with special needs may require specialized training and experience. Teaching assistants may be a student in a university education program or may be a full-time assistant.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Many job openings will be created each year from the need to replace workers who retire.

Employment opportunities for these workers are dependent upon classroom needs and government expenditure for education. Opportunities are slightly better for those assistants who work with special needs students in one-on-one situations.

Characteristics of Occupation

Estimated Employment in 2000: 21,800

	(%)
Male	9
Female	91
Full-time	44
Part-time	56
Self-employed	2
Employees	98
Working away from home	93
Working at home	3
No fixed workplace address	4

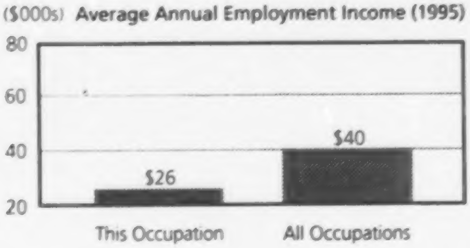
Employment by Region

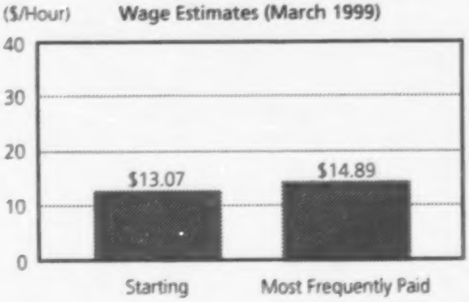
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	12	11
Toronto	40	42
London	6	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	2	3
Northeast	7	5
Northwest	3	2

Main Industries of Employment

	(%)
Educational service	98

Income and Wages





For more information

Association of Day Care Operators of Ontario (www.adco-o.on.ca)
Canadian Association of Montessori Teachers (www.camt.org)
Association of Early Childhood Educators, Ontario (www.cfc-efc.ca/aeceo)

7231 Machinists and Machining and Tooling Inspectors

Description

Machinists set up and operate a variety of machine tools to cut or grind metal and similar materials into parts or products with precise dimensions. Machining and tooling inspectors inspect machined parts and tooling in order to maintain quality control standards.

Common job titles: Automotive Machinist; General Machinist; Machine Parts Inspector; Machine Shop Inspector; Machine Tool Set-up Operator; Machining Inspector; Machinist; Machinist Apprentice; Maintenance Machinist; Tooling Inspector.

Typical employers: machine shop firms; motor vehicle parts manufacturers; machinery and equipment manufacturers; hardware, tool and cutlery manufacturers; aircraft and parts manufacturers; motor vehicle manufacturers; primary steel producers.

Selected Main Duties

Machinists perform some or all of the following duties:

- Read and interpret blueprints, charts and tables or study sample parts to determine machining operations to be performed;
- Compute dimensions and tolerance and measure and lay out work pieces;
- Set up and operate a variety of machine tools including computerized numeric control (CNC) tools to perform precision machining operations such as turning, milling, boring, planing, drilling, grinding;
- Fit and assemble machined metal parts and subassemblies using hand and power tools;
- Verify dimensions of products for accuracy and conformance to specifications using precision measuring instruments;
- Adjust and set up machine tools for use by machining tool operators.

Machining and tooling inspectors perform some or all of the following duties:

- Verify dimensions of machined parts or tooling using micrometers, verniers, callipers, height gauges, optical comparators or other specialized measuring instruments;
- Maintain, repair and calibrate precision measuring instruments such as dial indicators, fixed gauges, height gauges and other measuring devices;
- Report deviations from specifications and tolerances to supervisor;
- Maintain inspection records and complete inspection reports.

Working environment: A machinist works indoors, usually in industrial settings that are noisy and potentially hazardous. Frequent lifting and carrying of objects is required, as are prolonged periods of standing. A five-day workweek of 35 to 40 hours is standard. Shift work is not unusual. The work can be repetitive through long production runs. Computerized numeric control machines perform the more repetitious functions.

Education/Training

Completion of a four-year apprenticeship program or a combination of work experience in the trade and some college or industry courses in machining is usually required to be eligible for trade certification. Trade certification, however, is not compulsory in Ontario. There are two apprenticeship programs for this trade in the province. Interprovincial trade certification (Red Seal) is also available to qualified machinists.

Entry to apprenticeship requires a job. In the traditional route, the aspiring apprentice applies directly to the employer, union or joint industry committee for an apprenticeship opening. Alternatively, entry into apprenticeship can be pursued through pre-apprenticeship training.

Employment Prospects

Over the next five years: Strong

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Job seekers with the appropriate skills and qualifications can expect good job prospects, as employers across Ontario report difficulties in finding qualified workers to fill vacant positions. Many employers have been recruiting outside of Canada. The bulk of machinists are employed in the manufacturing industries.

The work of machinists continues to be transformed by the increasing use of sophisticated numerical control systems. New apprentices entering this field are increasingly expected to have a higher level of math and reading skills than what was traditionally expected prior to the adoption of these new technologies.

Characteristics of Occupation

Estimated Employment in 2000: 20,800

	(%)
Male	94
Female	6
Full-time	96
Part-time	4
Self-employed	2
Employees	98
Working away from home	97
Working at home	1
No fixed workplace address	2

Employment by Region

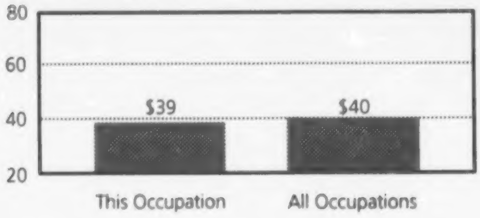
	(%) This Occupation	*(%) All Occupations*
Ottawa	4	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	15	9
Hamilton-Niagara Peninsula	20	11
Toronto	33	42
London	6	5
Windsor-Sarnia	9	5
Stratford-Bruce Peninsula	3	3
Northeast	4	5
Northwest	1	2

Main Industries of Employment

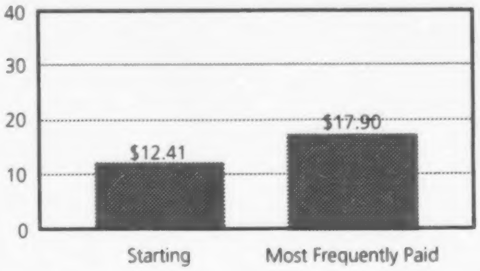
	(%)
Fabricated metals	38
Transportation equipment	20
Machinery	14
Primary metal	5

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Machinery and Equipment Manufacturers' Association of Canada (www.memac.org)
Automotive Parts Manufacturers' Association (www.capma.com)
Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/manufac.html)

7232 Tool and Die Makers

Description

Tool and die makers make, repair and modify custom-made, prototype or special tools, dies, jigs, fixtures and gauges which require precise dimensions. This group includes pattern and metal mould makers. The work involves the operation of lathes, grinders and milling and boring machines, and computerized numeric control (CNC) machines.

Common job titles: Die Finisher; Die Maker; Jig Maker; Metal Mould Maker; Metal Patternmaker; Mould Maker – Plastics Processing; Tool and Die Maker; Tool and Die Maker Apprentice; Tool Maker.

Typical employers: motor vehicle parts manufacturers; motor vehicle manufacturers; machine shop firms; machinery and equipment manufacturers; aircraft and parts manufacturers; hardware, tool and cutlery manufacturers.

Selected Main Duties

Tool and die makers work to close tolerances at all times. They perform some or all of the following duties:

- Read and interpret drawings and specifications of tools, dies, prototypes or models;
- Compute dimensions and tolerances and set up machine tools;
- Position, secure, measure and work metal stock or castings to lay out for machining;
- Operate a variety of machine tools including computerized numeric control tools to cut, turn, mill, plane, bore, grind or otherwise shape work piece to prescribed dimensions and finish;
- Verify machined parts for conformance to specifications using precision measuring instruments;
- Fit and assemble parts using hand tools;
- Machine, fit and assemble casting and other parts to make metal patterns, core boxes and match plates;
- Machine, fit and assemble parts to make metal moulds for plastic injection moulding or other production processes;
- Inspect and test completed tools, dies, jigs or fixtures for proper operation.

Working environment: The work is indoors and involves some exposure to noise and hazards requiring the use of safety equipment. Physical activities may include lifting and carrying heavy objects and periods of standing and handling machinery and material. A five-day workweek of 35 to 40 hours is normal. Shift work or occasional weekend work may be required.

Education/Training

For trade certification, educational requirements include the completion of a four-year tool and die making apprenticeship program or a combination of over five years of work experience in the trade and some high school, college or industry courses in tool and die making. In Ontario, trade certification is voluntary. Interprovincial trade certification (Red Seal) is also available to qualified tool and die makers. Mould making and patternmaking trade certification is also available, but not compulsory, in Ontario.

Most apprenticeship positions are never advertised or are only advertised through informal networks. Entry to apprenticeship requires a job. In the traditional route, the aspiring apprentice applies directly to the employer, union or joint industry committee for an apprenticeship opening. Alternatively, entry into apprenticeship can be pursued through pre-apprenticeship training.

Employment Prospects

Over the next five years: Strong

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. Job seekers with the appropriate skills and qualifications should have excellent opportunities of finding employment, as employers across Ontario report difficulties in finding qualified workers to fill vacant positions. Due to the large size of this occupational group, many additional openings will be created each year by tool and die makers who retire.

Over 95 percent of tool and die makers are employed in the manufacturing sector. Employment of these workers will be affected by advancements in automation, including CNC machine tools and computer-aided design (CAD). CNC machine tools have made tool and die makers more productive, while CAD and computer-aided manufacturing (CAM) have allowed some functions previously performed by these workers to be carried out by a computer and tool programmer.

The skills of this trade are portable and can be transferred to the general machinist trades.

Characteristics of Occupation

Estimated Employment in 2000: 16,300

	(%)
Male	97
Female	3
Full-time	96
Part-time	4
Self-employed	3
Employees	97
Working away from home	98
Working at home	1
No fixed workplace address	1

Employment by Region

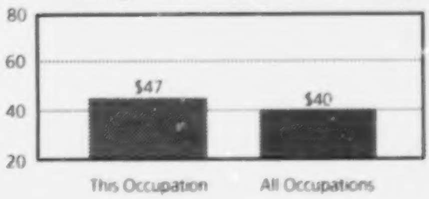
	(%) This Occupation	*(%) All Occupations*
Ottawa	1	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	14	9
Hamilton-Niagara Peninsula	12	11
Toronto	38	42
London	6	5
Windsor-Sarnia	23	5
Stratford-Bruce Peninsula	2	3
Northeast	0	5
Northwest	0	2

Main Industries of Employment

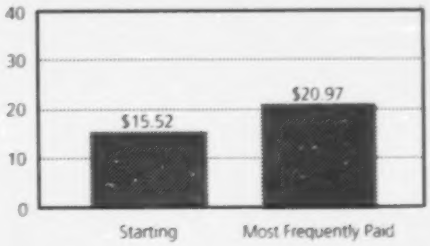
	(%)
Fabricated metal products	49
Transportation equipment	28
Machinery	5

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

International Special Tooling and Machining Association (www.istmaworld.org)
Automotive Parts Manufacturers' Association (www.capma.com)
Canadian Association of Mould Makers Inc. (www.cdnmolds.com)
Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/manufac.html)

7241 Electricians (Except Industrial and Power System)

Description

Electricians in this unit group lay out, assemble, install, test, troubleshoot and repair electrical wiring, fixtures, control devices and related equipment in buildings and other structures. Construction and maintenance electricians work on virtually every kind of residential and commercial building. Domestic and rural electricians perform the work of an electrician in the construction, repair, remodelling or alteration or maintenance of houses, multiple dwelling buildings or buildings and structures used for farming.

Common job titles: Apprentice Electrician; Construction Electrician; Electrician.

Typical employers: electrical construction firms; electric power companies.

Selected Main Duties

Construction and maintenance electricians perform some or all of the following duties:

- Lay out, assemble, repair, maintain, connect and test electrical fixtures, apparatus, control equipment and wiring;
- Work on alarm, communication, light, heating and power systems;
- Plan installations from blueprints or other specifications;
- Install panel boards, switch boxes, pull boxes and other related devices;
- Measure, cut, thread, bend, assemble and install conduits and other kinds of electrical conductor enclosures, which connect panels, boxes, outlets and other devices;
- Install brackets, hangers and the like to support electrical equipment;
- Test the equipment and systems to ensure they are functioning properly.

Domestic and rural electricians perform some or all of the following duties:

- Read and interpret drawings and electrical code specifications to determine wiring layouts for new or existing installations;
- Pull wire through conduits and through holes in walls and floors;
- Install, replace and repair lighting fixtures and electrical control and distribution equipment, such as switches, relays and circuit breaker panels;
- Splice, join and connect wire to fixtures and components to form circuits;
- Test continuity of circuits using test equipment to ensure compatibility and safety of system, following installation, replacement or repair;
- Troubleshoot and isolate faults in electrical and electronic systems and remove and replace faulty components;
- Connect electrical power to sound and visual communication equipment, signaling devices and heating and cooling systems;
- Conduct preventive maintenance programs and keep maintenance records.

Working environment: Electricians work both indoors and outdoors. Much of the electrical work is done while standing, often in confined spaces. Work may be seasonal and safety procedures must be observed at all times to guard against electrical shock.

Education/Training

Certificate of qualifications, gained through completion of an apprenticeship and/or examination is mandatory in Ontario. Apprenticeship applicants must be at least 16 and have Grade 10 or an equivalent, though many employers require Grade 12 or equivalent. Red Seal certification, facilitating interprovincial mobility, is available for this trade.

Most apprenticeship positions are never advertised or are only advertised through informal channels. Entry to apprenticeship requires a job. In the traditional route, the aspiring apprentice applies directly to the employer, union or joint industry committee for an apprenticeship opening. Alternatively, entry into apprenticeship can be pursued through pre-apprenticeship training.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through 2005. Due to the large size of this occupational group, many job openings will result from the need to replace workers who retire early.

Technological developments in building design are expected to enhance job opportunities for electricians. The increasing use of computers and electronics to control building functions and installations of integrated management, security and appliance systems will provide work for electricians and require additional skills.

Employment for these electricians is sensitive to the cyclical nature of the construction industry. Electricians generally work on a project-by-project basis. When construction activity is slack, they may experience unemployment while waiting for the next project.

Characteristics of Occupation

Estimated Employment in 2000: 17,900

	(%)
Male	98
Female	2
Full-time	91
Part-time	9
Self-employed	10
Employees	90
Working away from home	56
Working at home	5
No fixed workplace address	39

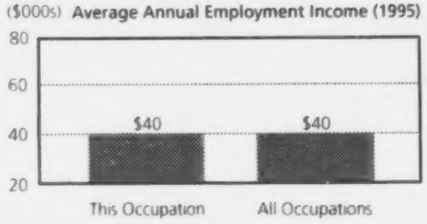
Employment by Region

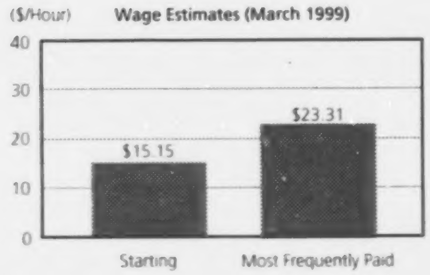
	(%) This Occupation	*(%) All Occupations*
Ottawa	11	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	12	11
Toronto	38	42
London	5	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	3	3
Northeast	5	5
Northwest	2	2

Main Industries of Employment

	(%)
Trade contracting	72
Manufacturing	8

Income and Wages





For more information

Canadian Electrical Contractors Association (www.ceca.org)
Electrical Contractors Association of Ontario (www.ecao.org)
Ontario Construction Secretariat (www.iciconstruction.com)
Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/contsruct.html)

7242 Industrial Electricians

Description

Industrial electricians install, maintain, test, troubleshoot and repair industrial electrical equipment and associated electrical and electronic controls on hydraulic and pneumatic equipment.

Common job titles: Industrial Electrician; Marine Electrician; Mill Electrician; Mine Electrician; Plant Electrician; Plant Maintenance Electrician.

Typical employers: electrical construction firms; motor vehicle manufacturers; primary steel producers; mining companies; pulp and paper companies; motor vehicle parts manufacturers; electric power companies.

Selected Main Duties

Industrial electricians perform some or all of the following duties:

- Read and interpret drawings and electrical code specifications to determine layout of industrial electrical equipment installations;
- Install, examine, replace or repair electrical wiring, receptacles, switch boxes, conduits, feeders, cable assemblies, lighting fixtures and other electrical components;
- Test electrical and electronic equipment and components for continuity, current, voltage and resistance;
- Maintain, repair, install and test switchgears, transformers, switchboard meters, regulators and reactors;
- Maintain, repair, test and install electrical motors, generators, industrial storage batteries and hydraulic and pneumatic electrical control systems;
- Troubleshoot, maintain and repair industrial electrical and electronic control systems and devices;
- Conduct preventive maintenance programs and keep maintenance records.

This trade is similar to that of the construction and maintenance electrician, except that an industrial electrician is permanently employed in an industrial plant, and the trade is covered by a different regulation.

Working environment: Much of electrical work is done in a standing position often in confined spaces. Risks involved include falling from a height or receiving an electrical shock. Shift work is usually required, but work is generally indoors. The work entails considerable variety and problem solving.

Education/Training

Completion of a four-year industrial electrician apprenticeship program or a combination of over five years of work experience in the trade and some high school, college or industry courses in industrial electrical equipment is usually required to be eligible for trade certification. Entry into an apprenticeship program requires having a job with an employer as an apprentice. Math and physics are essential for this trade and some employers require Grade 12 or higher.

This is a voluntary trade in Ontario. Workers can obtain a certificate of qualification by passing a government examination. The certificate is not mandatory, but it does indicate a certain level of achievement and is required by some employers. Interprovincial trade certification (Red Seal) is also available to qualified industrial electricians.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005.

Production technologies involving robotics and automated transfer machinery have created new areas of work for industrial electricians. As robots and other computerized control equipment become the norm in many of the manufacturing industries, the electricians who install and repair it are an increasingly important part of the manufacturing team.

Characteristics of Occupation

Estimated Employment in 2000: 12,600

	(%)
Male	99
Female	1
Full-time	97
Part-time	3
Self-employed	2
Employees	98
Working away from home	87
Working at home	1
No fixed workplace address	12

Employment by Region

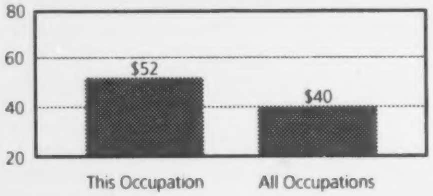
	(%) This Occupation	*(%) All Occupations*
Ottawa	3	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	17	11
Toronto	31	42
London	5	5
Windsor-Sarnia	10	5
Stratford-Bruce Peninsula	2	3
Northeast	14	5
Northwest	4	2

Main Industries of Employment

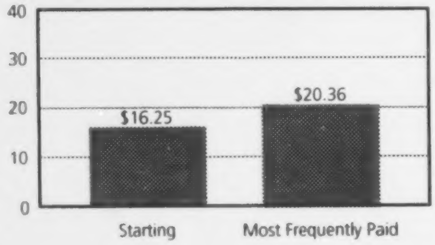
	(%)
Trade contracting	19
Transportation equipment	16
Primary metal	11
Mining	6
Paper and allied products	5

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Canadian Electrical Contractors Association (www.ceca.org)
Electrical Contractors Association of Ontario (www.ecao.org)
Ontario Construction Secretariat (www.iciconstruction.com)
Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/contruct.html)

7244 Electrical Power Line and Cable Workers

Description

Electrical power line and cable workers construct, maintain and repair overhead and underground electrical power transmission and distribution systems.

Common job titles: Apprentice Lineman/Woman, Electrical Power Line; Cable Installer, Electrical Power; Cable Splicer, Electrical Power; Construction Lineman/Woman, Electrical Power Line; Power Line Patroller; Power Lineman/Woman.

Typical employers: electric power companies; highway and heavy construction firms; electrical construction firms.

Selected Main Duties

Electrical power line and cable workers perform some or all of the following duties:

- Install, maintain and repair electrical distribution and transmission systems including overhead and underground power lines and cables, insulators, conductors, lightning arrestors, switches, transformers and other associated equipment;
- Erect and maintain steel, wood or concrete poles, towers and guy wires;
- Splice, solder and insulate conductors and related wiring to connect power distribution and transmission networks using splicing tools and related electrical equipment and tools;
- Inspect and test overhead and underground power lines and cables and auxiliary equipment using electrical test equipment;
- Climb ladders or operate hydraulic buckets when working aloft on poles and towers, or work in confined spaces such as trenches and tunnels to install power lines and cables and associated equipment;
- Install and maintain street lighting systems;
- Adhere to safety practices and procedures;
- Communicate with other workers to co-ordinate the preparation and completion of work assignments.

Working environment: Linemen/women often work in a variety of work sites depending upon the location of high-voltage transmission lines, support towers, etc. Repair and service linemen/women are on call most of the time and may work for long periods during emergency conditions, such as major storms. A powerline maintainer's job often entails work on lines carrying up to 500 kilovolts of electricity and work may be performed from helicopters. There is also some work on underground systems. Some jobs require living in bush camps for weeks on end while new lines are installed. Electrical linemen/women work all year, but activity tends to be more intense during summer months.

Education/Training

Apprenticeship applicants must be at least 16 and have Grade 10 or an equivalent. However, Ontario Hydro and municipal utilities give preference to applicants with higher education. Therefore, Grade 12 or higher is recommended, as is background in mathematics and physics.

This is a voluntary trade, which means a worker can obtain a certificate of qualification by passing a government examination. The certificate is not mandatory, but it does indicate a certain level of achievement and is required by some employers. Interprovincial trade certification (Red Seal) is available for qualified linemen/women.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through 2005 despite a growing demand for electricity and the need to maintain existing lines.

Employment in this occupation depends heavily on the rate of expansion of electrical generating and transmission capacity. Major electrical utilities are not in an expansion mode; indeed, fiscal restraint is leading to reductions in employment levels for workers in utility companies.

Characteristics of Occupation

Estimated Employment in 2000: 3,600

	(%)
Male	97
Female	3
Full-time	97
Part-time	3
Self-employed	1
Employees	99
Working away from home	85
Working at home	0
No fixed workplace address	15

Employment by Region

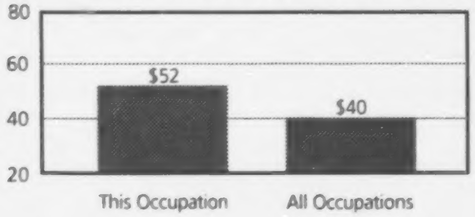
	(%) This Occupation	*(%) All Occupations*
Ottawa	7	10
Kingston-Pembroke	8	4
Muskoka-Kawarthas	6	3
Kitchener-Waterloo-Barrie	12	9
Hamilton-Niagara Peninsula	9	11
Toronto	28	42
London	6	5
Windsor-Sarnia	7	5
Stratford-Bruce Peninsula	6	3
Northeast	7	5
Northwest	4	2

Main Industries of Employment

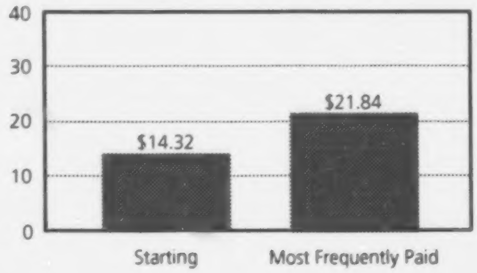
	(%)
Communications and other utilities	79
Construction	14

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Canadian Electrical Contractors Association (www.ceca.org)

Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/appren.html)

7246 Telecommunications Installation and Repair Workers

Description

Telecommunications installation and repair workers install, test, maintain and repair telephones, telephone switching equipment or other telecommunications equipment such as cellular telephones.

Common job titles: Apprentice Communication Electrician, Switching; Cellular Telephone Technician; Central Office Technician; Communication Technician, Telephone; Exchange Tester; Line and Station Installer, Telephone; Mobile Radio Installer; Private Branch Exchange Installer; Switch Network Installer and Repairer; Telecommunications Equipment Technician; Telephone Installer.

Typical employers: telecommunication companies; electronic equipment manufacturers; electrical construction firms; metal and metal products wholesalers.

Selected Main Duties

Telephone installers and repairers perform some or all of the following duties:

- Install, arrange, remove and maintain telephone equipment, wiring and associated hardware;
- Test installed telephone systems to locate transmission faults;
- Repair or replace defective and damaged telephones, wire and associated equipment.

Switch network installers and repairers perform some or all of the following duties:

- Install electro mechanical, analog and digital trunking systems, circuits and equipment in telecommunications central offices and switching centres;
- Inspect and test trunking systems, circuits and equipment;
- Analyse test results and adjust, change or repair switching system and associated equipment.

Telecommunications service testers perform some or all of the following duties:

- Operate computerized testing systems to conduct service tests on customer lines and equipment;
- Determine the nature, cause and location of service trouble;
- Initiate the dispatch of appropriate repair personnel;
- Complete test reports and maintain test and service records;
- Assist repair personnel to test lines, circuits and systems, isolate and clear cable faults and verify records.

Telecommunications equipment technicians perform some or all of the following duties:

- Install, remove and maintain various telecommunications equipment and related systems such as telex and facsimile machines, teletypewriters, mobile radios, cellular telephones, and other related telecommunications equipment;
- Inspect and test operation of telecommunications equipment;
- Diagnose and locate equipment faults, and adjust, replace or repair telecommunications equipment.

Working environment: The working conditions vary greatly depending on the nature of the position. Line installers work outdoors, often in inclement weather, installing poles and lines. When services are underground, line installers must work in very cramped quarters following lines through small passageways. Wiring technicians work regular hours indoors, but they may be on call 24 hours a day for emergency repairs.

Education/Training

Telephone and switch network installers and repairers require completion of an apprenticeship program ranging from three to four years or a combination of over three years work experience in the trade and some high school, college or industry related courses. Telecommunications equipment technicians usually require completion of a college electrical and electronics program and several months of on-the-job training. Experience as an installer and repairer (telephone and switch network) is usually required for service testers.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005.

The greater use of telecommunications technologies and the convergence of telephones, cable and computers will continue to provide good employment prospects for workers in this occupation whose skills reflect the latest technologies. The telecommunications industry is undergoing restructuring, and installation work increasingly outsourced. The increase in wireless communications technology will also significantly change the skills required for this occupation in the future.

Characteristics of Occupation

Estimated Employment in 2000: 9,500

	(%)
Male	88
Female	12
Full-time	93
Part-time	7
Self-employed	4
Employees	96
Working away from home	81
Working at home	3
No fixed workplace address	16

Employment by Region

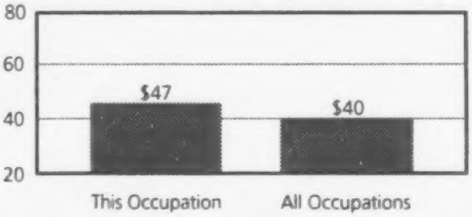
	(%) This Occupation	*(%) All Occupations*
Ottawa	14	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	9	11
Toronto	48	42
London	4	5
Windsor-Sarnia	2	5
Stratford-Bruce Peninsula	2	3
Northeast	5	5
Northwest	2	2

Main Industries of Employment

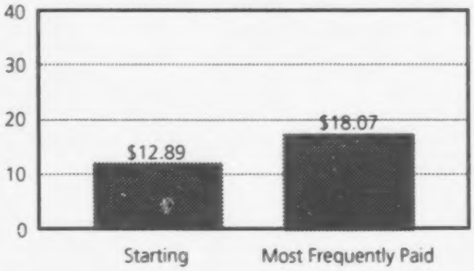
	(%)
Communication and other utilities	72
Manufacturing	7
Wholesale trade	7
Construction	5

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Canadian Wireless Telecommunications Association (www.cwta.ca)
Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/appren.html)

7251 Plumbers

Description

Plumbers install, repair and maintain pipes, fixtures and other plumbing equipment used for water distribution and waste water disposal in residential, commercial and industrial buildings. Plumbers are involved in maintenance work and new construction projects.

Common job titles: Maintenance Plumber; Plumber; Plumber Apprentice; Plumbing Mechanic.

Typical employers: plumbing, heating and air conditioning construction firms.

Selected Main Duties

Plumbers perform some or all of the following duties:

- Read blueprints, drawings and specifications to determine layout of plumbing system, water supply network and waste and drainage systems;
- Install, repair and maintain domestic, commercial or industrial plumbing fixtures and systems;
- Locate and mark positions for pipe connections, passage holes and fixtures in walls and floors;
- Cut opening in walls and floors to accommodate pipe and pipe fittings;
- Measure, cut, bend and thread pipes using hand and power tools or machines;
- Join pipes using couplings, clamps, screws, bolts, cement or soldering, brazing and welding equipment;
- Test pipes for leaks using air and water pressure gauges.

Working environment: The work is done both indoors and outdoors. Safety has a high priority. Plumbers have to be aware of the dangers of working on rigging and scaffolding and in and around trenches. Before proceeding with their work, plumbers must inspect the job site for such hazards as power lines, flammable materials and unsecured loads.

Education/Training

Completion of a four to five-year apprenticeship program or a combination of over five years of work experience in the trade and some high school, college or industry courses in plumbing is usually required to be eligible for trade certification. Trade certification is compulsory in Ontario. Interprovincial trade certification (Red Seal) is available to qualified plumbers.

Apprenticeship applicants must be at least 16 and have Grade 10 or an equivalent, though many employers require Grade 12.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Jobs in the plumbing trades are determined primarily by the existing stock of piping that must be maintained and the amount of new construction and renovation work.

Technological advances in plumbing are creating the need for higher skills. Computer literacy is becoming much more important, as the use of computers in drawing, estimating, coordination and cost reporting related to plumbing expands. Increasingly, computer-controlled equipment is being utilized on the job. The plumbing trade is changing through increased installation of integrated plumbing systems in home construction, an increase in prefabrication, and new technologies in gas and water piping. More sophisticated measuring devices are being introduced and better material handling and joining methods are being developed.

Characteristics of Occupation

Estimated Employment in 2000: 9,900

	(%)
Male	99
Female	1
Full-time	90
Part-time	10
Self-employed	14
Employees	86
Working away from home	52
Working at home	6
No fixed workplace address	42

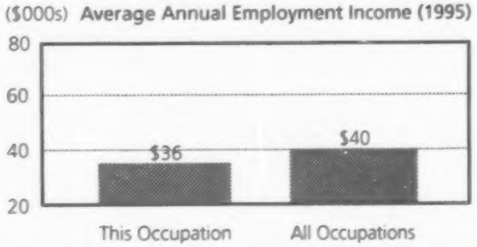
Employment by Region

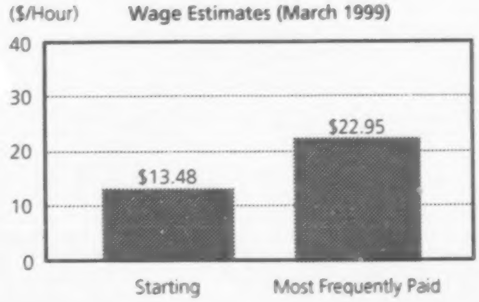
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	5	4
Muskoka-Kawarthas	4	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	11	11
Toronto	37	42
London	6	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	4	3
Northeast	6	5
Northwest	3	2

Main Industries of Employment

	(%)
Trade contracting	81

Income and Wages





For more information

Canadian Institute of Plumbing and Heating (www.ciph.com)
Ontario Construction Secretariat (www.iciconstruction.com)
Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/construct.html)

7252 Steamfitters, Pipefitters and Sprinkler System Installers

Description

Steamfitters and pipefitters lay out, assemble, fabricate, maintain and repair piping systems carrying water, steam, chemicals and fuel in heating, cooling, lubricating and other process piping systems. Sprinkler system installers fabricate, install, test, maintain and repair water, foam, carbon dioxide and dry chemical sprinkler systems in buildings for fire protection purposes.

Common job titles: Fire Sprinkler Fitter; Marine Pipefitter; Pipefitter; Sprinkler System Fitter; Sprinkler System Installer; Steamfitter.

Typical employers: plumbing, heating and air conditioning construction firms; mechanical construction firms; pulp and paper companies; primary steel producers; electric power companies; motor vehicle manufacturers; residential building developers; metal fabricating companies.

Selected Main Duties

Steam fitters and pipe fitters perform some or all of the following duties:

- Read and interpret drawings and specifications to determine layout requirements;
- Cut openings for pipe in walls, floors and ceilings using hand or power tools or machines;
- Select type and size of pipe required;
- Measure, cut, thread and bend pipe to required shape using hand and power tools;
- Weld, braze, cement, solder and thread joints to join pipes and fabricate sections of piping system;
- Test system for leaks using testing equipment;
- Clean and maintain pipe units and fittings;
- Remove and replace worn components;
- Prepare cost estimates for clients.

Sprinkler system installers perform some or all of the following duties:

- Read and interpret drawings and specifications to determine layout requirements;
- Install clamps, brackets and hangers to support piping system and sprinkler and fire protection equipment, using hand and power tools;
- Select, measure, cut, ream and thread pipe and mount prepared pipe in supports;
- Join pipes and piping sections using soldering and welding equipment;
- Connect piping system to water mains, supply tanks, pumps, compressors and control equipment;
- Test system for leaks using air or liquid pressure equipment;
- Prepare cost estimates for clients.

Working environment: The work is both indoors and outdoors. Safety has a high priority. Steamfitters have to be aware of the dangers of working on rigging and scaffolding and in and around trenches. They must inspect job sites, noting such hazards as power lines, flammable materials and unsecured loads.

Education/Training

Steamfitter-Pipefitter trade certification is compulsory in Ontario. However, Sprinkler System Installer trade certification is voluntary but still requires work experience and some high school, college or industry courses over four to five years. Apprenticeship programs are available in these trades in Ontario. Interprovincial trade certification (Red Seal) is also available to qualified Steamfitters-Pipefitters and Sprinkler System Installers. There is a great deal of overlap between the plumber and steamfitter trades.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Many job openings will become available each year from the need to replace experienced workers who retire.

Employment in the piping trades is determined by the volume of new construction requiring piping installation and by the existing stock of piping that must be maintained. There is growing demand for fitting sprinkler systems to meet changes in fire code regulations. In this area, computer literacy is becoming essential, as sprinklers are increasingly electronically controlled. As building codes change, sprinkler fitters will need a better knowledge of products, applications and fire protection requirements. Integration of sprinkler systems with thermal storage systems is expected to be an increasing element in the work of sprinkler fitters.

Characteristics of Occupation

Estimated Employment in 2000: 9,200

	(%)
Male	99
Female	1
Full-time	94
Part-time	6
Self-employed	2
Employees	98
Working away from home	69
Working at home	2
No fixed workplace address	29

Employment by Region

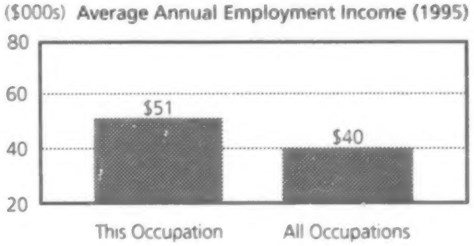
	(%) This Occupation	*(%) All Occupations*
Ottawa	7	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	20	11
Toronto	25	42
London	4	5
Windsor-Sarnia	16	5
Stratford-Bruce Peninsula	2	3
Northeast	8	5
Northwest	5	2

Main Industries of Employment

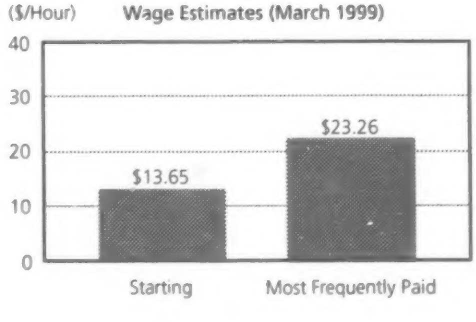
	(%)
Construction	51
Manufacturing	30

Income and Wages

Average Annual Employment Income (1995)



Wage Estimates (March 1999)



For more information

Ontario Construction Secretariat (www.iciconstruction.com)

Canadian Institute of Plumbing and Heating (www.ciph.com)

Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/contsruct.html)

7261 Sheet Metal Workers

Description

Sheet metal workers fabricate, assemble, install and repair sheet metal products. They shear, form, fabricate, weld, solder and assemble a host of items made from galvanized iron, sheet steel, copper, nickel alloy, stainless steel, aluminum and such materials as plastics and ceramics.

Common job titles: Apprentice Sheet Metal Worker; Coppersmith; Sheet Metal Fabricator; Sheet Metal Mechanic; Sheet Metal Worker.

Typical employers: plumbing, heating and air conditioning construction firms; primary steel producers; exterior construction firms; stamping press and coated metal products companies; construction trades; aircraft and parts manufacturers; fabricated structural metal product producers; building construction firms.

Selected Main Duties

Sheet metal workers perform some or all of the following duties:

- Read drawings and sketches of work to be performed and lay out, measure and mark sheet metal according to drawings or templates;
- Operate light metal working machines such as shears, brakes, punches and drill presses to cut, bend, punch, drill, shape or straighten sheet metal;
- Operate laser or plasma cutting equipment to cut sheet metal;
- Fit and join sheet metal parts using riveter, welding, soldering and similar equipment to fabricate products such as ventilation shafts, eavestroughs, partition frames, air and heat ducts, roof decking and sheet metal buildings;
- Grind and buff seams, joints and rough surfaces;
- Inspect product quality and installation to ensure conformance to specifications.

Working environment: Sheet metal workers on construction sites must often work in cramped and awkward positions. As a rule, manufacturing or shop work is done indoors. On the construction site, there may be exposure to extreme weather conditions. In factories, there is a certain degree of exposure to noise and dust. In some cases, as in the installation of cladding, sheet metal workers work high above the ground.

Education/Training

Trade certification is compulsory in Ontario. Those seeking to enter an apprenticeship program must be at least 16 and have Grade 10 or an equivalent, although many employers require higher educational standards. Interprovincial (Red Seal) certification is available.

Entry to apprenticeship requires a job. In the traditional route, the aspiring apprentice applies directly to the employer, union or joint industry committee for an apprenticeship opening. Alternatively, entry into apprenticeship can be pursued through pre-apprenticeship training.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005.

Technology is impacting on the skill levels required for this occupation. New materials (e.g., plastics, composites, etc.) with different installation techniques and joining methods are requiring additional skills for sheet metal workers. The largest increases in skill requirements, however, can be expected from increased operation of computer-controlled equipment, such as laser cutting and computer-assisted design programs.

Characteristics of Occupation

Estimated Employment in 2000: 6,000

	(%)
Male	98
Female	2
Full-time	94
Part-time	6
Self-employed	6
Employees	94
Working away from home	77
Working at home	2
No fixed workplace address	21

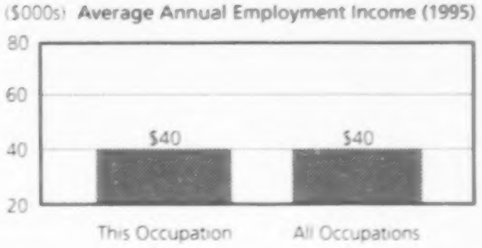
Employment by Region

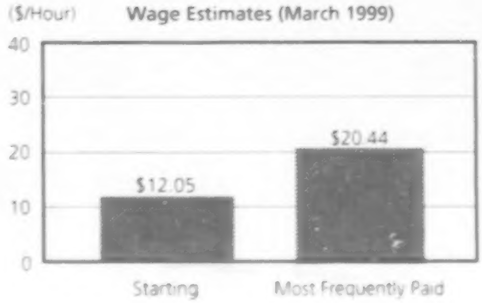
	(%) This Occupation	*(%) All Occupations*
Ottawa	4	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	4	3
Kitchener-Waterloo-Barrie	12	9
Hamilton-Niagara Peninsula	13	11
Toronto	42	42
London	4	5
Windsor-Sarnia	8	5
Stratford-Bruce Peninsula	2	3
Northeast	5	5
Northwest	4	2

Main Industries of Employment

	(%)
Trade contracting	48
Fabricated metal products	23
Transportation equipment	6

Income and Wages





For more information

Ontario Construction Secretariat (www.iciconstruction.com)

Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/construct.html)

7271 Carpenters

Description

Carpenters construct, erect, install, maintain and repair structures and components of structures made of wood, wood substitutes and other materials. Some carpenters, such as finish carpenters, do detailed work requiring a high level of skill, while rough carpenters involved in framing and forming are less skilled.

Common job titles: Apprentice Carpenter; Carpenter; Finish Carpenter; Journeyman/woman Carpenter; Maintenance Carpenter; Renovation Carpenter; Rough Carpenter.

Typical employers: residential building developers; building construction firms; interior and finishing construction firms, non-residential building developers; maintenance departments of factories, plants and other organizations; self-employment.

Selected Main Duties

Carpenters perform some or all of the following duties:

- Read and interpret blueprints, drawings and sketches to determine specifications and calculate requirements;
- Prepare layouts in conformance to building codes, using measuring tools;
- Measure, cut, shape, assemble and join materials made of wood, wood substitutes and other materials;
- Build foundations, install floor beams, lay subflooring and erect walls and roof systems;
- Fit and install trim items, such as doors, stairs, moulding and hardware;
- Maintain, repair and renovate residences and wooden structures in mills, mines, hospitals, industrial plants and other establishments;
- Supervise apprentices and other construction workers;
- Prepare cost estimates for clients.

Working environment: Carpenters are needed at each stage of a construction project, from the rough carpentry required in building forms to hold new concrete to adding detailed finishing touches such as mouldings. Accordingly, projects can range from indoor to outdoor work.

Education/Training

Completion of a three to four-year apprenticeship program or a combination of over four years of work experience in the trade and some high school, college or industry courses in carpentry is usually required to be eligible for trade certification which is voluntary in Ontario. Interprovincial trade certification (Red Seal) is also available to qualified carpenters.

Entry to apprenticeship requires a job. In the traditional route, the aspiring apprentice applies directly to the employer, union or joint industry committee for an apprenticeship opening. Alternatively, entry into apprenticeship can be pursued through pre-apprenticeship training.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. Many job openings will become available each year from the need to replace older workers who retire.

New materials and construction techniques are transforming carpentry. New tools, such as nailers and sanders with electronic speed control, reduce fatigue and make carpenters more efficient. New building techniques, such as plastic concrete forms, also affect the skill requirements and the demand for carpenters. Carpenters will have to be more familiar with the use of prefabricated components, such as pre-hung doors and windows, and prefabricated wall panels and stairs, which can be installed very quickly. With pre-assembly, there will be an increased need to understand specific subsystems (e.g., floor systems, wall systems). This trend will lead to a shift in some job functions for some carpenters, from "craftsperson" tasks to "assembly" tasks.

Characteristics of Occupation

Estimated Employment in 2000: 35,700

	(%)
Male	99
Female	1
Full-time	85
Part-time	15
Self-employed	27
Employees	73
Working away from home	37
Working at home	6
No fixed workplace address	57

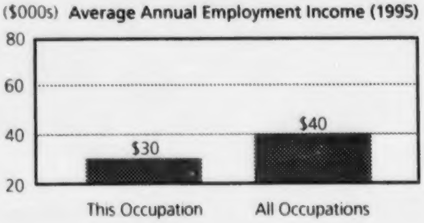
Employment by Region

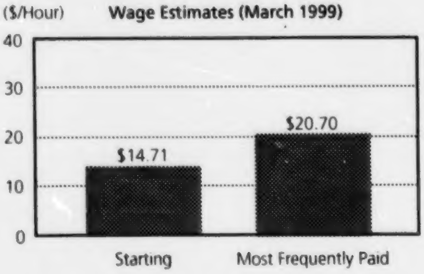
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	5	4
Muskoka-Kawarthas	6	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	10	11
Toronto	34	42
London	4	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	4	3
Northeast	8	5
Northwest	5	2

Main Industries of Employment

	(%)
Trade contracting	40
Building construction	39
Manufacturing	8

Income and Wages





For more information

Ontario Construction Secretariat (www.iciconstruction.com)
Council of Ontario Construction Associations (www.coca.on.ca/coca)
Ontario Home Builders' Association (www.homesontario.com)
Ministry of Training, Colleges and Universities (www.edu.gov.ca/eng/training/apprenticeship/construct.html)

7272 Cabinetmakers

Description

Cabinetmakers construct and repair wooden cabinets, furniture, fixtures and related products.

Common job titles: Cabinetmaker; Cabinetmaker Apprentice; Custom Wood Furniture Maker; Furniture Cabinetmaker.

Typical employers: household furniture makers; interior and finishing construction firms; door and other millwork companies; household furniture stores; office furniture makers; furniture and fixture companies; residential building developers; building construction firms.

Selected Main Duties

Cabinetmakers perform some or all of the following duties:

- Study plans, specifications or drawings of articles to be made, or prepare specifications;
- Mark outlines or dimensions of parts on wood;
- Operate woodworking machines, such as power saws, jointers, mortisers and shapers, and use hand tools to cut, shape and form parts and components;
- Trim joints and fit parts and subassemblies together to form complete unit using glue and clamps and reinforce joints using nails, screws or other fasteners;
- Sand wooden surfaces and apply veneer, stain or polish to finished products;
- Repair or restyle wooden furniture, fixtures and related products.

Working environment: Work settings for cabinetmakers include factories and custom shops, where workers are exposed to noise, vibration and dust. A five-day workweek of 35 to 40 hours is normal.

Education/Training

Some secondary school education is usually required. Completion of a three to four-year apprenticeship program or a combination of work experience in the trade and some high school or college courses in cabinetmaking is usually required to be eligible for trade certification.

An apprenticeship training program exists for cabinetmakers in Ontario but certification is voluntary. Some community colleges offer training programs in industrial woodworking, cabinetmaking techniques, furniture products techniques and woodworking technology. Interprovincial trade certification (Red Seal) is also available to qualified cabinetmakers.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. While job growth will create new positions, many job openings will result from replacement needs as experienced workers retire. Many employers report difficulties in finding qualified workers to fill vacant positions.

Employment in this occupation is sensitive to economic cycles. Increasingly, more cabinets are built in factories rather than made to order. The market for made-to-order cabinets will become a specialty market, with room for only the most highly skilled cabinetmakers. The basic skills required for this occupation – literacy, numeracy and wood science skills – are rising. According to a 1995 sector study published by Human Resources Development Canada, employers in the wood household sub-sector of the furniture industry anticipate future skill gaps in the areas of quality standards and in operating advanced machinery such as computerized routers.

Characteristics of Occupation

Estimated Employment in 2000: 9,400

	(%)
Male	96
Female	4
Full-time	89
Part-time	11
Self-employed	24
Employees	76
Working away from home	81
Working at home	13
No fixed workplace address	6

Employment by Region

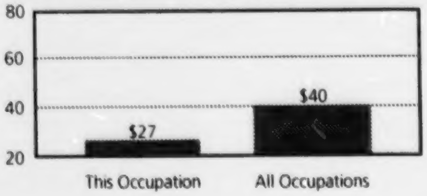
	(%) This Occupation	*(%) All Occupations*
Ottawa	6	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	4	3
Kitchener-Waterloo-Barrie	12	9
Hamilton-Niagara Peninsula	11	11
Toronto	45	42
London	6	5
Windsor-Sarnia	7	5
Stratford-Bruce Peninsula	3	3
Northeast	3	5
Northwest	2	2

Main Industries of Employment

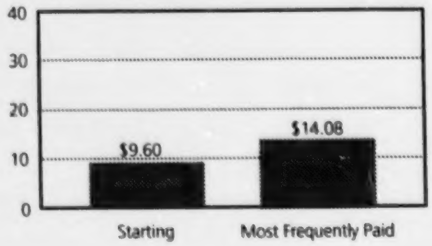
	(%)
Furniture and fixture producers	34
Wood producers	28
Trade contracting	23

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Woodweb (www.woodweb.com)
Rideau Cabinets (www.cabinetmaking.com)
Ministry of Training, Colleges and Universities (www.edu.gov.ca/eng/training/apprenticeship/appren.html)

7281 Bricklayers

Description

Bricklayers lay bricks, concrete blocks, stone and other similar materials to construct or repair walls and other structures in accordance with blueprints and specifications. They construct, erect, install and repair walls, arches, paving, floors, fireplaces, chimneys, smokestacks and other such structures. Their work also encompasses the laying of fire brick and other refractory materials used in the construction of industrial furnaces, retorts and boilers and similar installations.

Common job titles: Apprentice Bricklayer; Bricklayer; Brickmason; Marble Mason; Refractory Bricklayer; Stonecutter; Stonemason.

Typical employers: exterior construction firms; residential building developers; building construction firms; primary steel producers; construction contractors.

Selected Main Duties

Bricklayers perform some or all of the following duties:

- Prepare and lay bricks, concrete blocks, stone, structural tiles and similar materials to construct or repair walls, foundations and other structures in residential, industrial and commercial construction;
- Lay bricks or other masonry units to build residential or commercial chimneys and fireplaces;
- Lay radial bricks to build masonry shells of industrial chimneys;
- Lay or install firebricks to line industrial chimneys and smokestacks;
- Line or reline furnaces, kilns, boilers and similar installations using refractory or acid-resistant bricks, refractory concretes, plastic refractories and other materials;
- Lay bricks, stone or similar materials to provide veneer facing to walls or other surfaces;
- Construct and install prefabricated masonry units;
- Lay bricks or other masonry units to build patios, garden walls and other decorative installations.

Working environment: Bricklayers must be able to use their hands and tools and work to exact standards. They are often employed on a project-by-project basis, either as employees or as independent contractors. Masons who are members of construction union locals usually work out of a union hiring hall where work is allotted on a rotating basis.

Education/Training

This is a voluntary trade, meaning journeymen can obtain a certificate of qualification by passing a government examination, but it is not compulsory. Apprenticeship applicants in the province must be at least 16 and have some high school education. Some employers may require at least Grade 10 level of education. Interprovincial trade certification (Red Seal) is also available to qualified bricklayers.

Entry to apprenticeship requires a job. In the traditional route, the aspiring apprentice applies directly to the employer, union or joint industry committee for an apprenticeship opening. Alternatively, entry into apprenticeship can be pursued through pre-apprenticeship training.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow more rapidly than the average for all occupations through the year 2005. Some employers have reported difficulties in finding qualified workers to fill vacant positions.

The demand for bricklayers is closely tied to the construction industry, particularly to the residential sector where brick as a building material is fashionable. Retrofit/restoration is also an important part of the work of bricklayers. This trend requires bricklayers to exercise more judgement in the matching of existing brickwork.

Masons who work on construction projects may experience periods of idleness as they wait for new work following completion of a project. Lay-offs also tend to occur during the winter months.

Characteristics of Occupation

Estimated Employment in 2000: 5,700

	(%)
Male	99
Female	1
Full-time	87
Part-time	13
Self-employed	14
Employees	86
Working away from home	29
Working at home	3
No fixed workplace address	68

Employment by Region

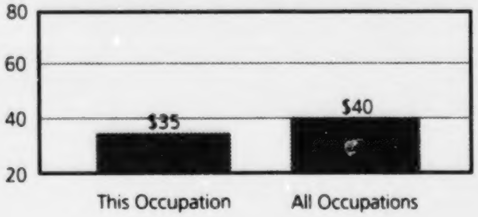
	(%) This Occupation	*(%) All Occupations*
Ottawa	8	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	4	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	12	11
Toronto	43	42
London	6	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	2	3
Northeast	7	5
Northwest	1	2

Main Industries of Employment

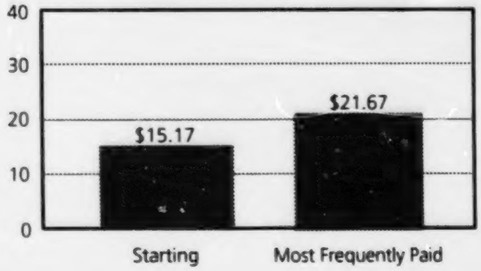
	(%)
Trade contracting	75
Industrial and heavy construction	13

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Ontario Construction Secretariat (www.iciconstruction.com)
Ontario Masonry Contractors Association (www.omca.org)
Ministry of Training, Colleges and Universities (www.edu.gov.ca/eng/training/apprenticeship/appren.html)

7311 Construction Millwrights and Industrial Mechanics (Except Textile)

Description

Construction millwrights and industrial mechanics install, maintain and repair stationary industrial machinery and mechanical equipment. Construction millwrights are mostly engaged in the initial installation of industrial plant machinery and equipment; industrial mechanics are more concerned with the post-installation maintenance and repair of machinery and equipment.

Common job titles: Construction Millwright; Industrial Mechanic; Maintenance Millwright; Millwright; Millwright Apprentice; Plant Equipment Mechanic; Treatment Plant Mechanic.

Typical employers: primary steel producers; motor vehicle manufacturers; motor vehicle parts manufacturers; pulp and paper companies; electric power companies; mining companies; mechanical construction firms; machinery and equipment manufacturers.

Selected Main Duties

Construction millwrights and industrial mechanics perform some or all of the following duties:

- Read diagrams and schematic drawings to determine work procedures;
- Install stationary industrial machinery and mechanical equipment according to layout plans using hand and powertools;
- Operate hoisting and lifting devices to position machinery and parts during the installation, setup and repair of machinery;
- Inspect and examine machinery and equipment to detect and investigate irregularities and malfunctions;
- Adjust machinery and repair or replace defective parts;
- Operate machine tools such as lathes and grinders to fabricate parts required during overhaul, maintenance or setup of machinery;
- Clean, lubricate and perform other routine maintenance work on machinery;
- Construct foundations for machinery or direct other workers to construct foundations;
- Assemble machinery and equipment prior to installation using hand and power tools and welding equipment.

Working environment: While some activities occur in industrial and commercial construction, work is usually indoors at industrial plants or in commercial or institutional buildings, where noise, vibrations and other hazards are common on the job. The workweek normally consists of five days or 35 to 40 hours, and includes occasional shift work and overtime.

Education/Training

Completion of a three to four-year apprenticeship program or a combination of over five years of work experience in the trade and some high school, college or industry courses in industrial machinery repair or millwrighting is usually required to be eligible for trade certification. Construction millwright trade certification is available, but not compulsory in Ontario. Interprovincial trade certification (Red Seal) is also available to qualified industrial mechanics or millwrights.

Most apprenticeship positions are never advertised or are only advertised through informal channels. Entry to apprenticeship requires a job. In the traditional route, the aspiring apprentice applies directly to the employer, union or joint industry committee for an apprenticeship opening. Alternatively, entry into apprenticeship can be pursued through pre-apprenticeship training.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. While job growth will create new positions, many job openings will stem from replacement needs as experienced millwrights retire. Many employers report difficulties in finding qualified workers to fill vacant positions. Many employers have been recruiting outside Canada for workers.

Millwrights and industrial mechancis are employed in a variety of industries where they maintain and repair existing machinery, dismantle old machinery, and install new equipment. New technologies like hydraulic torque wrenches, ultrasonic measuring tools, and laser shaft alignment will affect the work of millwrights, and they must acquire the skills to use these devices.

Characteristics of Occupation

Estimated Employment in 2000: 41,800

	(%)
Male	99
Female	1
Full-time	97
Part-time	3
Self-employed	1
Employees	99
Working away from home	95
Working at home	1
No fixed workplace address	4

Employment by Region

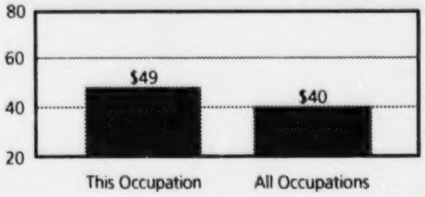
	(%) This Occupation	*(%) All Occupations*
Ottawa	4	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	4	3
Kitchener-Waterloo-Barrie	11	9
Hamilton-Niagara Peninsula	17	11
Toronto	30	42
London	5	5
Windsor-Sarnia	8	5
Stratford-Bruce Peninsula	4	3
Northeast	9	5
Northwest	4	2

Main Industries of Employment

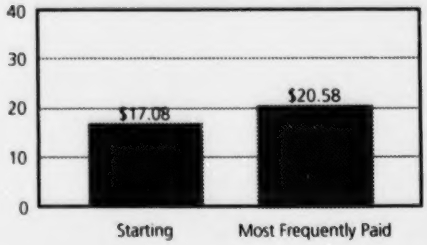
	(%)
Transportation equipment	16
Food products	8
Primary metal	8
Paper and allied products	7
Fabricated metal products	7

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Ontario Construction Secretariat (www.iciconstruction.com)

Ministry of Training, Colleges and Universities (www.edu.gov.ca/eng/training/apprenticeship/manufac.html)

7312 Heavy-Duty Equipment Mechanics

Description

Heavy-duty equipment mechanics repair, overhaul and maintain mobile heavy-duty equipment used in construction, forestry, mining, material handling, landscaping, land clearing, farming and similar activities.

Common job titles: Construction Equipment Mechanic; Farm Equipment Mechanic; Heavy-Duty Equipment Mechanic Apprentice; Heavy Equipment Mechanic; Heavy Mobile Logging Equipment Mechanic; Heavy Mobile Mining Equipment Mechanic; Tractor Mechanic.

Typical employers: heavy equipment dealers; establishments that own and operate heavy equipment in mining, manufacturing, transportation and construction; heavy equipment rental and service establishments.

Selected Main Duties

Heavy-duty equipment mechanics perform some or all of the following duties:

- Check bulldozers, cranes, graders and other heavy construction, logging and mining equipment for proper performance;
- Inspect equipment to detect faults and malfunctions and diagnose to determine extent of repair required;
- Adjust equipment and repair or replace defective parts, components or systems, using hand and power tools;
- Test repaired equipment for proper performance and to ensure that work meets manufacturers' specifications;
- Clean, lubricate and perform other routine maintenance work on equipment;
- Perform repair work on heavy trucks.

Working environment: The workweek normally consists of five days or 35 to 40 hours and includes occasional periods of shift work and overtime. Heavy-duty equipment mechanics work with oil and grease. They work mainly outdoors and sometimes in remote locations. Safety is an important part of the job, especially when climbing on and off equipment.

Education/Training

Completion of a four-year apprenticeship program or a combination of over four years of work experience in the trade and some high school, college or industry courses in heavy equipment repair is usually required to be eligible for trade certification. Heavy-duty equipment mechanic trade certification and farm equipment mechanic trade certification are both voluntary in Ontario. Interprovincial trade certification (Red Seal) is also available.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Job seekers with the appropriate skills and qualifications can expect good job prospects, as employers across Ontario report difficulties in finding qualified workers to fill vacant positions.

These mechanics increasingly work with computerized machinery and need to have the skills this type of work requires. Many mechanics also need good communication skills, as they work directly with clients. The skills learned in this trade are transferable to other motive power trades, including motor vehicle mechanic, truck coach mechanic, farm equipment mechanic and motorcycle mechanic.

Characteristics of Occupation

Estimated Employment in 2000: 11,100

	(%)
Male	98
Female	2
Full-time	94
Part-time	6
Self-employed	6
Employees	94
Working away from home	89
Working at home	5
No fixed workplace address	6

Employment by Region

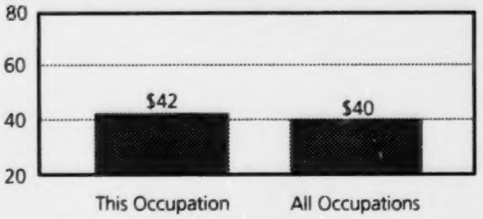
	(%) This Occupation	*(%) All Occupations*
Ottawa	5	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	12	11
Toronto	21	42
London	6	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	5	3
Northeast	25	5
Northwest	7	2

Main Industries of Employment

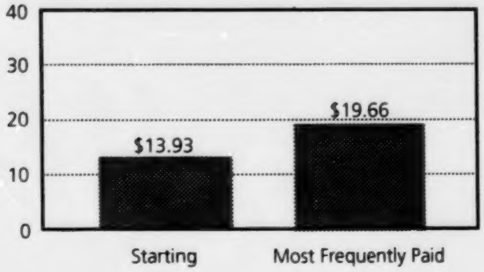
	(%)
Machinery wholesalers	22
Manufacturing	15
Mining	12
Transportation	12
Construction	11

Income and Wages

($000s) Average Annual Employment Income (1995)



($/Hour) Wage Estimates (March 1999)



For more information

Canadian Association of Equipment Distributors (www.caed.org)

Ministry of Training, Colleges and Universities (www.edu.gov.ca/eng/training/apprenticeship/auto.html)

7313 Refrigeration and Air Conditioning Mechanics

Description

Refrigeration and air conditioning mechanics install, maintain, repair and overhaul residential central air conditioning systems, commercial and industrial refrigeration and air conditioning systems and combined heating and cooling systems.

Common job titles: Central Air Conditioning Mechanic; Commercial Air Conditioning Mechanic; Heating and Cooling Mechanic; Refrigeration and Air Conditioning Mechanic; Refrigeration and Air Conditioning Mechanic Apprentice; Refrigeration Mechanic.

Typical employers: plumbing, heating and air conditioning construction firms; mechanical construction firms; commercial refrigerator and air conditioner manufacturers; appliance, television, radio and stereo stores.

Selected Main Duties

Refrigeration and air conditioning mechanics perform some or all of the following duties:

- Read and interpret blueprints, drawings or other specifications;
- Measure and lay out reference points for installation;
- Assemble and install refrigeration or air conditioning components such as motors, controls, gauges, valves, pumps, condensers and compressors using hand and power tools;
- Measure and cut piping, and connect piping using welding and brazing equipment;
- Install, repair and maintain combined heating and cooling units;
- Start up system and test for leaks using testing devices;
- Recharge system with refrigerant and perform routine maintenance or servicing;
- Repair and replace parts and components or overhaul entire refrigeration, air conditioning or heat pump systems;
- Prepare work estimates for clients.

Working environment: Refrigeration and air conditioning mechanics work in homes, restaurants, supermarkets, hospitals and anywhere where cooling systems are operating. The specific work conditions are highly dependent on the location of the repair job. Several hazards, including electric shock, burns and muscle strain, pose a constant threat but safety precautions reduce the risk greatly. Overtime and irregular hours are common during peak periods in hot weather. The work is mainly indoors, though some installations will involve outside work.

Education/Training

Completion of a four-year apprenticeship program or a combination of over five years of work experience in the trade and some high school, college or industry courses in refrigeration and air conditioning repair is usually required to be eligible for trade certification. Trade certification is compulsory in Ontario. Interprovincial trade certification (Red Seal) is also available to qualified refrigeration and air conditioning mechanics. A mechanical aptitude and a good background in mathematics is important for this trade.

Entry to apprenticeship requires a job. In the traditional route, the aspiring apprentice applies directly to the employer, union or joint industry committee for an apprenticeship opening.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow more rapidly than the average for all occupations through the year 2005. Many employers report difficulties in finding qualified workers to fill vacant positions.

As the population and economy grow, the demand for this occupational group will increase due to the installation of new, more efficient air conditioning and refrigeration systems. Much of the work for these mechanics will be in maintenance and repair which usually remains relatively stable.

As in most other trades, there is an increasing need for computer literacy and the ability to operate computer-controlled equipment.

Characteristics of Occupation

Estimated Employment in 2000: 7,500

	(%)
Male	99
Female	1
Full-time	93
Part-time	7
Self-employed	10
Employees	90
Working away from home	62
Working at home	3
No fixed workplace address	35

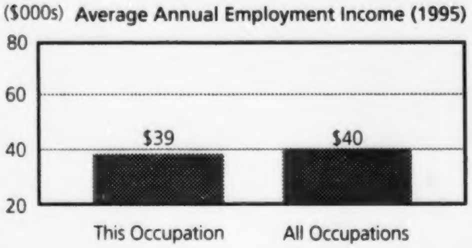
Employment by Region

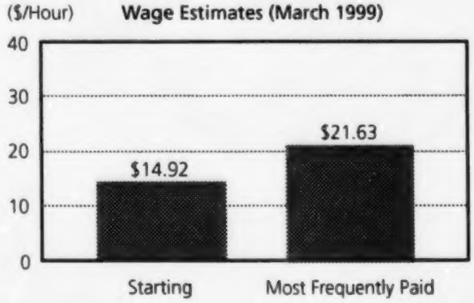
	(%) This Occupation	*(%) All Occupations*
Ottawa	13	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	11	11
Toronto	44	42
London	4	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	2	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

	(%)
Trade contracting	74
Wholesale trade	6
Manufacturing	6

Income and Wages





For more information

Ontario Construction Secretariat (www.iciconstruction.com)

Heating, Refrigeration and Air Conditioning Institute of Canada (www.hrai.ca)

American Society of Heating, Refrigerating and Air Conditioning Engineers (www.ashrae.org)

Ministry of Training, Colleges and Universities (www.edu.gov.ca/eng/training/apprenticeship/appren.html)

7315 Aircraft Mechanics and Aircraft Inspectors

Description

Aircraft mechanics maintain, repair and overhaul aircraft structures, mechanical and hydraulic systems. Aircraft inspectors inspect aircraft and aircraft systems following manufacture, modification, maintenance, repair or overhaul.

Common job titles: Aircraft Inspector; Aircraft Maintenance Engineer; Aircraft Mechanic, Engine Overhaul; Aircraft Systems Inspector; Certified Aircraft Technician; Hydraulics Mechanic; Inspector, Flight Test; Inspector, Repair and Overhaul; Mechanic, Aircraft Maintenance; Shop Inspector, Aircraft Repair.

Typical employers: airline companies; aircraft and parts manufacturers; service firms to air transport companies; defense services; federal government.

Selected Main Duties

Aircraft mechanics perform some or all of the following duties:

- Troubleshoot aircraft structural, mechanical or hydraulic systems to identify problems and adjust and repair systems according to specifications and established procedures;
- Repair and overhaul aircraft structural, mechanical or hydraulic systems;
- Install or modify aircraft engines or other aircraft systems;
- Dismantle airframes, aircraft engines or other aircraft systems for repair and overhaul, and reassemble;
- Work on specific aircraft systems such as engines, engine accessories, airframes or hydraulic systems.

Aircraft inspectors perform some or all of the following duties:

- Inspect structural and mechanical systems of aircraft and certify that these systems meet Transport Canada and company standards of performance and safety;
- Inspect work of aircraft mechanics performing maintenance, repair and overhaul, or modification of aircraft and aircraft mechanical systems to ensure adherence to standards and procedures;
- Maintain detailed repair, inspection and certification records and reports.

Working environment: Operations, which are carried out mostly in hangars, expose workers to noise, vibration, liquids, fumes and other hazards requiring the use of safety equipment and clothing. A five-day, 40-hour workweek including shift work and overtime is normal.

Education/Training

A college diploma in aircraft maintenance is usually required as is several years of on-the-job training. Aircraft mechanics who sign maintenance releases require an Aircraft Maintenance Engineer's (AME) license issued by Transport Canada. Aircraft inspectors require several years of experience as an aircraft mechanic and an Aircraft Maintenance Engineer's (AME) license with endorsements for specific aircraft types and aircraft systems. The Canadian Aviation Maintenance Council is establishing national minimum standards for these occupations through curriculum development, program accreditation and voluntary employee registration.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to increase more slowly than the average for all occupations through 2005. Major commercial airplane manufacturers, such as Boeing and Airbus, forecast steady growth in regional and commuter airplanes over the next decade. As a result, airline industry officials foresee improving demand in a series of maintenance and repair related skills over the next several years.

New aircraft have a higher proportion of computerized aircraft components. The skill levels required for this occupation are rising. Increasingly, mechanics are expected to interpret technical drawings and manuals, as well as, possess a good understanding of mathematics, electronics and computers. Those working on aircrafts will require basic avionics skills and knowledge about a variety of new materials. There is a trend toward specialization; repair and overhaul of avionics components will rest with workers who specialize in particular components.

Characteristics of Occupation

Estimated Employment in 2000: 2,500

	(%)
Male	97
Female	3
Full-time	95
Part-time	5
Self-employed	4
Employees	96
Working away from home	95
Working at home	2
No fixed workplace address	3

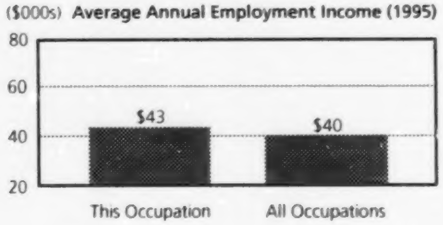
Employment by Region

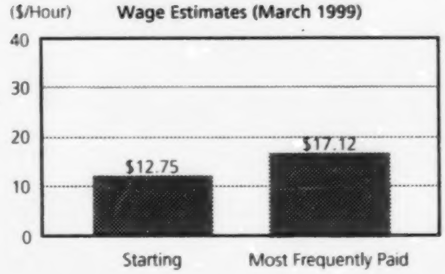
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	8	11
Toronto	49	42
London	3	5
Windsor-Sarnia	1	5
Stratford-Bruce Peninsula	2	3
Northeast	7	5
Northwest	5	2

Main Industries of Employment

	(%)
Transportation	55
Transportation equipment manufacturers	29
Government service	7

Income and Wages





For more information

Canadian Aviation Maintenance Council (www.camc.ca)
Aerospace Industries Association of Canada (www.aiac.ca)
Transport Canada (www.tc.gc.ca)

7321 Motor Vehicle Mechanics, Technicians and Mechanical Repairers

Description

Motor vehicle mechanics and technicians inspect, diagnose, repair and service mechanical, electrical and electronic systems and components of cars, buses and trucks. Motor vehicle mechanics may specialize in a specific area such as engine, fuel or transmission systems. Mechanical repairers perform major repairs and replacement of mechanical units on newly assembled motor vehicles.

Common job titles: Automobile Mechanic; Automotive Service Technician; Car Mechanic; Motor Repairer, Automobile Manufacturing; Transmission Mechanic; Truck Mechanic; Tune Up Specialist, Motor Vehicle.

Typical employers: automotive service shops; automobile dealers; motor vehicle manufacturers; service stations; trucking companies; public transit commissions; motor vehicles wholesalers; automotive parts and accessories stores; motor vehicle parts manufacturers.

Selected Main Duties

Motor vehicle mechanics and technicians perform some or all of the following duties:

- Review work orders and discuss work with supervisor;
- Inspect motor in operation, road test motor vehicle and test automotive systems and components using testing devices to diagnose and isolate faults;
- Adjust, repair or replace parts and components of automotive systems including fuel, brake, steering and suspension systems, transmissions, emission control and exhaust systems, engines and electrical, cooling and climate control systems using hand tools and other specialized automotive repair equipment;
- Test and adjust repaired systems to manufacturer's performance specifications;
- Perform scheduled maintenance service, such as oil changes, lubrications and tune ups;
- Advise customers on work performed, general vehicle conditions and future repair requirements.

Mechanical repairers in motor vehicle manufacturing perform some or all of the following duties:

- Inspect and test mechanical units, such as engines and transmissions, to locate faults and malfunctions;
- Diagnose faults or malfunctions and confirm with supervisor to determine whether to repair or replace unit;
- Repair or replace mechanical units or components using hand and power tools;
- Test and adjust units to specifications for proper performance;
- Complete reports to record problems and work performed.

Working environment: Motor vehicle mechanics work steady, year round. Most of the time they work indoors, though there is the occasional outdoor job. Exposure to noise, vibration, liquids, fumes and odours is controlled by safety regulations. Mechanics are usually paid on a flat rate basis or by the amount of time taken to repair a vehicle. Mechanics work varied hours. New entrants to the trade must be prepared to invest in their own tools.

Education/Training

Completion of a four-year motor vehicle mechanic apprenticeship program or a combination of over four years of work experience in the trade and high school, college or industry courses in automotive technology is required to be eligible for trade certification. This is a compulsory trade, meaning a certificate of qualification gained through apprenticeship and/or examination is mandatory. Interprovincial trade certification (Red Seal) is also available to qualified automobile mechanics and truck and transport mechanics.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Due to the large size of this occupational group, replacement needs are expected to create a substantial number of job openings yearly.

Car and truck manufacturers are producing vehicles that require less maintenance and repair. At the same time, increasingly complex motor vehicle systems, the use of propane vehicles and other innovations are increasing the educational and skill requirements in this occupation. A shift to team-based repair operations also requires new skills.

Characteristics of Occupation

Estimated Employment in 2000: 52,300

	(%)
Male	99
Female	1
Full-time	93
Part-time	7
Self-employed	9
Employees	91
Working away from home	94
Working at home	3
No fixed workplace address	3

Employment by Region

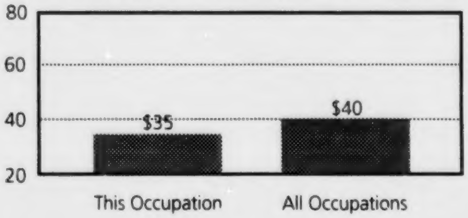
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	4	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	11	11
Toronto	38	42
London	6	5
Windsor-Sarnia	7	5
Stratford-Bruce Peninsula	3	3
Northeast	6	5
Northwest	2	2

Main Industries of Employment

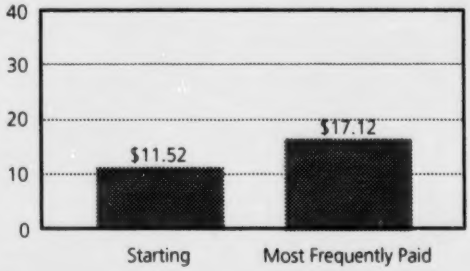
	(%)
Automotive vehicle retail trade	67
Transportation	10
Transportation equipment manufacturers	6

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Automotive Industries Association of Canada (www.aiacanada.com)
Canadian Automotive Repair and Service (www.cars-council.ca)
Ministry of Training, Colleges and Universities (www.edu.gov.ca/eng/training/apprenticeship/auto.html)

7322 Motor Vehicle Body Repairers

Description

Motor vehicle body repairers repair and restore damaged motor vehicle body parts and interior finishing. This occupational group also includes metal repairers who repair defective automobile body parts and damage to the bodies of newly assembled cars.

Common job titles: Autobody Repairer; Automotive Body Mechanic; Automotive Body Technician; Body Repairer, Motor Vehicle; Metal Finisher, Motor Vehicle Manufacturing; Metal Repairer, Motor Vehicle Manufacturing; Motor Vehicle Body Technician; Painter, Motor Vehicle Repair.

Typical employers: motor vehicle repair shops; automobile dealers; motor vehicle manufacturers; motor vehicle parts manufacturers.

Selected Main Duties

Motor vehicle body repairers perform some or all of the following duties:

- Review damage reports and estimates of repair costs and plan work to be performed;
- Repair and replace front end components, body components, doors and frame and underbody components;
- Hammer out dents, buckles and other defects using blocks and hammers;
- Operate soldering equipment or use plastic filler to fill holes, dents and seams;
- Remove damaged fenders, panels and grills using wrenches and cutting torch and bolt or weld replacement parts into place;
- Straighten bent frames using frame and underbody pulling and anchoring equipment;
- File, grind and sand repaired body surfaces using hand and power tools;
- Apply primers and repaint surfaces using brush or spray guns;
- Repair or replace interior components, such as seat frame assembly, carpets and floor board insulation;
- Inspect repaired vehicles and test drive vehicles for proper handling.

Working environment: Motor vehicle body repairers work indoors and are exposed to noise, vibration, liquids, fumes and odours. These are, however, controlled by safety regulations. Full-time work is 40 hours per week. Some Saturday or overtime work may be required.

Education/Training

Completion of a three to four-year apprenticeship program or a combination of over three years of work experience in the trade and completion of a high school or college automotive body repair program is usually required to be eligible for trade certification. Apprenticeship applicants must be at least 16 and have Grade 10 or an equivalent, though some employers require Grade 12. Trade certification is compulsory in Ontario. Interprovincial trade certification (Red Seal) is also available to qualified motor vehicle body repairers.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Job seekers with the appropriate skills and qualifications can expect good job prospects, as employers across Ontario report difficulties in finding qualified workers to fill vacant positions.

Today, automobile bodies can be repaired with less labour content than before. Better corrosion resistance resulting from the use of new body materials, such as new treated steels and plastics, is prolonging body life. At the same time, the increased complexity of repair tasks resulting from new ways of working with improved materials and unit frame bodies, requires that repairers have a higher level of skills.

Characteristics of Occupation

Estimated Employment in 2000: 13,400

	(%)
Male	98
Female	2
Full-time	90
Part-time	10
Self-employed	12
Employees	88
Working away from home	92
Working at home	4
No fixed workplace address	4

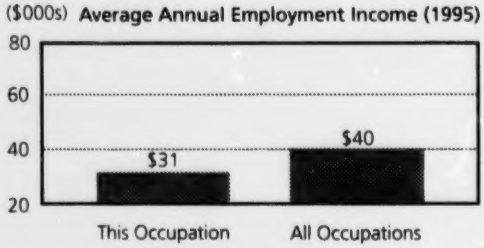
Employment by Region

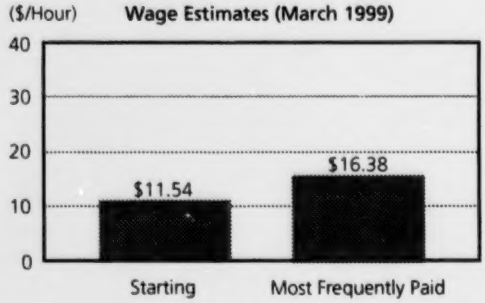
	(%) This Occupation	*(%) All Occupations*
Ottawa	6	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	5	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	13	11
Toronto	38	42
London	6	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	3	3
Northeast	6	5
Northwest	2	2

Main Industries of Employment

	(%)
Automotive vehicles retail trade	87

Income and Wages





For more information

Canadian Automotive Repair Service Sector Council (www.cars-council.ca)
Durham Region Local Training Board (www.drltb.com)
Automotive Industries Association of Canada (www.aiacanada.com)
Ministry of Training, Colleges and Universities (www.edu.gov.ca/eng/training/apprenticeship/auto.html)

7332 Electric Appliance Servicers and Repairers

Description

Electric appliance servicers and repairers service and repair domestic electrical appliances.

Common job titles: Appliance Repairer Apprentice; Appliance Servicer; Appliance Service Technician; Dishwasher Repairer; Refrigerator Repairer; Service Technician; Stove Repairer; Vacuum Cleaner Repairer; Washing Machine Servicer.

Typical employers: appliance, television, radio and stereo stores; general merchandise stores; plumbing, heating and air conditioning construction firms; major appliance manufacturers; mechanical construction firms; electrical construction firms; machinery and equipment wholesalers; household furniture stores.

Selected Main Duties

Small appliance repairers perform some or all of the following duties:

- Repair small appliances, such as electrical lawn and garden equipment and power tools;
- Consult customer or refer to work order to establish nature of the appliance malfunction;
- Observe operation of appliance and conduct voltage, resistance and other tests using electrical test equipment;
- Refer to schematic drawings or product manuals and replace or repair parts or components using hand tools and soldering equipment;
- Prepare estimates and written accounts of work performed.

Major appliance repairers and technicians perform some or all of the following duties:

- Repair major appliances, such as domestic refrigerators and window air conditioners, in customer's home during service calls or in repair shop;
- Consult customer or refer to work order to establish nature of the appliance malfunction;
- Diagnose faults by checking controls, condensers, timer sequences, fans and other components using test equipment such as meters and gauges to measure resistance, current, voltage and pressure;
- Refer to schematic diagrams or product manuals and disassemble appliance using hand tools;
- Replace components and subcomponents and reassemble appliance using hand tools and soldering and brazing equipment;
- Prepare estimates and written accounts of work performed;
- Plan service routes.

Working environment: Appliance servicers and repairers sometimes work shift work, including weekends and holidays, to meet client needs. Shop or bench repairs are generally done in clean, well-ventilated, well-lighted areas. Physical activity is moderate. Service on major home appliances is usually done by a technician working from a van or a truck.

Education/Training

Small appliance repairers usually require some specialized college or high school courses or several months of on-the-job training. Major appliance service and repair technicians require some secondary school education and completion of a college program in appliance or electronics repair. In Ontario, there is an apprenticeship program with voluntary trade certification. A considerable portion of appliance service technicians, however, are self-taught or have learned through on-the-job training.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through 2005. Many job openings, however, will be created each year from the need to replace workers who retire.

The range of products is enormous with similar products potentially having diverse technical requirements. The actual demand for service, however, is based on the failure rate of each product and the individual consumer's decision on the cost-effectiveness of repair versus replacement. The increased use of electronic parts and improvements in product design, manufacturing techniques and quality control have resulted in greater product reliability and durability. As a result, servicers and repairers are facing greater complexity and multiple skill requirements.

Characteristics of Occupation

Estimated Employment in 2000: 2,100

	(%)
Male	96
Female	4
Full-time	84
Part-time	16
Self-employed	21
Employees	79
Working away from home	69
Working at home	11
No fixed workplace address	21

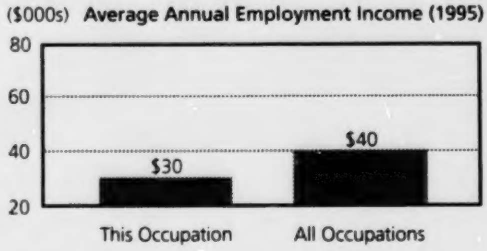
Employment by Region

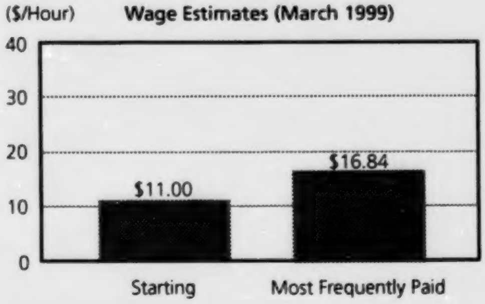
	(%) This Occupation	*(%) All Occupations*
Ottawa	5	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	5	3
Kitchener-Waterloo-Barrie	11	9
Hamilton-Niagara Peninsula	14	11
Toronto	37	42
London	6	5
Windsor-Sarnia	7	5
Stratford-Bruce Peninsula	4	3
Northeast	6	5
Northwest	2	2

Main Industries of Employment

	(%)
Retail trade	62
Wholesale trade	11
Manufacturing	10

Income and Wages





For more information

Electronic and Appliance Service Industry (www.easi.ca/easi)

Ministry of Training, Colleges and Universities (www.edu.gov.ca/eng/training/apprenticeship/appren.html)

7351 Stationary Engineers and Auxiliary Equipment Operators

Description

Stationary engineers and auxiliary equipment operators operate and maintain various types of stationary engines and auxiliary equipment such as boilers, turbines, generators, compressors and other equipment to provide heat, ventilation, refrigeration, light and power for buildings, industrial plants and other work sites.

Common job titles: Auxiliary Plant Operator; Boiler Operator; Power Engineer; Power Engineer Apprentice; Stationary Engineer; Stationary Engineer Apprentice; Steam Plant Operator.

Typical employers: hospitals; pulp and paper companies; electric power companies; elementary and secondary schools; primary steel producers; federal government; mining companies; motor vehicle manufacturers; universities.

Selected Main Duties

Stationary engineers and auxiliary equipment operators perform some or all of the following duties:

- Operate automated or computerized control systems, stationary engines and auxiliary equipment such as boilers, turbines, generators, compressors and other equipment to provide heat, ventilation, refrigeration, light and power for buildings, industrial plants and other work sites;
- Monitor and inspect plant equipment, switches, valves, gauges, alarms, meters and other instruments to measure temperature, pressure and fuel flow, to detect leaks or other equipment malfunctions and to ensure plant equipment is operating normally;
- Analyse and record instrument readings and equipment malfunctions;
- Make adjustments or minor repairs as required;
- Clean and lubricate generators, turbines, pumps and compressors and perform other routine equipment maintenance duties using appropriate lubricants and hand tools.

Working environment: Work involves exposure to high temperatures and contact with oil, grease, chemicals and odours. The normal workweek is 40 hours and overtime is common, as well as, shift work. Often, new employees start by working weekends and evenings.

Education/Training

Completion of high school and a regulated apprenticeship program in stationary or power engineering or on-the-job training and correspondence courses, or a college training program in stationary or power engineering is required.

Provincial or territorial certification according to class (4th, 3rd, 2nd and 1st class) is required. With very few exceptions, employers require certification at one of the four levels. In Ontario, licensing is carried out by the Technical Standards and Safety Authority under specific terms of agreement with the Ministry of Consumer and Commercial Relations. Stationary Engineers are classified according to skill and experience, with fourth class being the entry level and first class being the top level. An examination is required in order to be certified at each level.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to increase more slowly than the average for all occupations through 2005. Many job openings, however, will be created each year from the need to replace workers who retire.

Continuing commercial and industrial development will increase the amount of equipment to be operated and maintained. However, automated systems and computerized controls are making newly-installed equipment more efficient, thus reducing the number of jobs needed for their operation. As equipment becomes more computerized and mechanization increases, operators will require greater computer skills. They will increasingly have to interpret instructions and understand electronic controls and printouts as opposed to just mechanical operations.

Characteristics of Occupation

Estimated Employment in 2000: 6,500

	(%)
Male	97
Female	3
Full-time	98
Part-time	2
Self-employed	1
Employees	99
Working away from home	96
Working at home	1
No fixed workplace address	3

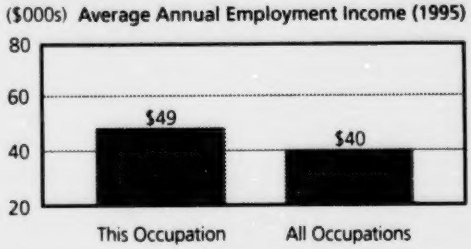
Employment by Region

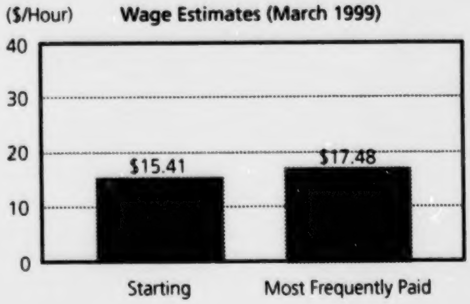
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	5	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	8	9
Hamilton-Niagara Peninsula	16	11
Toronto	25	42
London	5	5
Windsor-Sarnia	9	5
Stratford-Bruce Peninsula	3	3
Northeast	13	5
Northwest	7	2

Main Industries of Employment

	(%)
Manufacturing	46
Utility establishments	11
Health and social service	10
Education service	8

Income and Wages





For more information

Plant Engineering and Maintenance Association of Canada (www.pemac.org)
Technical Standards and Safety Authority (www.tssa.org)
Association for Facilities Engineering (www.afe.org)

7371 Crane Operators

Description

Crane operators operate cranes or draglines to lift, move, position or place machinery, equipment and other large objects at construction or industrial sites, ports, railway yards and other similar locations. Crane operators operate electric powered hoisting cranes which move, raise and lower heavy objects. Loads are raised, lowered and positioned in response to hand or audio signals from other crew members. Tower crane operators' responsibilities include ensuring breaking controls and switches are working.

Common job titles: Boom Truck Crane Operator; Bridge Crane Operator; Climbing Crane Operator; Construction Crane Operator; Crane Operator; Dragline Crane Operator; Gantry Crane Operator; Mobile Crane Operator; Tower Crane Operator; Tractor Crane Operator.

Typical employers: primary steel producers; construction site maintenance firms; building construction firms; waste materials wholesalers; residential building developers; metal and metal products wholesalers; electric power companies.

Selected Main Duties

Crane operators perform some or all of the following duties:

- Operate mobile and tower cranes to lift, move, position or place equipment and materials at construction sites, shipyards, industrial yards and similar locations;
- Operate pile driving cranes to drive pilings into earth to provide support for buildings and other structures;
- Operate cranes equipped with dredging attachments to dredge waterways and other areas;
- Operate gantry cranes to load and unload ship cargo at port side;
- Operate locomotive cranes to move objects and materials at railway yards;
- Operate bridge or overhead cranes to lift, move and place plant machinery and materials;
- Operate offshore oil rig cranes to unload and reload supply vessels;
- Operate cranes mounted on boats or barges to lift, move and place equipment and materials;
- Perform routine maintenance work such as cleaning and lubricating cranes.

Working environment: The work may be seasonal, and all of it is outdoors, which may expose the operator to adverse weather, high noise levels and dangerous locations.

Education/Training

Some secondary school education is required. Completion of a one to three-year apprenticeship program is required. Mobile crane and tower crane operators trade certifications are compulsory in Ontario. Mobile crane operators may also require a provincial license to drive mobile cranes on public roads. Internal company certification as a crane operator may be required by some employers. Interprovincial trade certification (Red Seal) is also available to mobile crane operators.

Most apprenticeship positions are not advertised or are only advertised through informal channels. Entry to apprenticeship requires a job. In the traditional route, the aspiring apprentice applies directly to the employer, union or joint industry committee for an apprenticeship opening. Alternatively, entry into apprenticeship can be pursued through pre-apprenticeship training.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through 2005. Many job openings, however, will be created each year from the need to replace workers who retire. Employment for crane operators is concentrated in manufacturing and construction industries, which are sensitive to changes in economic conditions.

Robotics and computerized controls will increase the skill requirements for crane operators, but may decrease demand for these workers. Operators will have to be able to read instructions and become more adaptable to using electronic controls versus mechanical operations.

Characteristics of Occupation

Estimated Employment in 2000: 5,600

	(%)
Male	99
Female	1
Full-time	97
Part-time	3
Self-employed	1
Employees	99
Working away from home	89
Working at home	1
No fixed workplace address	10

Employment by Region

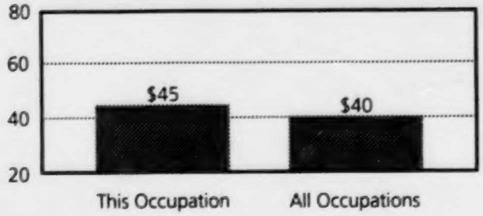
	(%) This Occupation	*(%) All Occupations*
Ottawa	3	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	6	9
Hamilton-Niagara Peninsula	43	11
Toronto	19	42
London	3	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	2	3
Northeast	13	5
Northwest	2	2

Main Industries of Employment

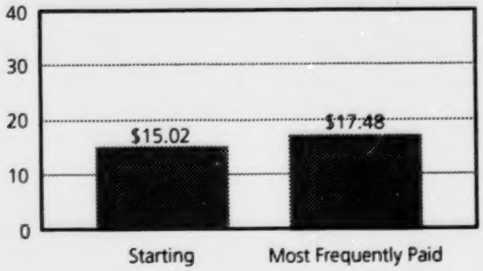
	(%)
Primary metal	40
All other manufacturing	20
Construction	20
Wholesale trade	11

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Durham Region Local Training Board (www.drltb.com)
Ontario Construction Secretariat (www.iciconstruction.com)
Ministry of Training, Colleges and Universities (www.edu.gov.ca/eng/training/apprenticeship/appren.html)

7411 Truck Drivers

Description

Truck divers operate heavy trucks to transport goods and materials over urban, interurban, provincial and international routes.

Common job titles: Bulk Goods Truck Driver; Dump Truck Driver; Flatbed Truck Driver; Logging Truck Driver; Long Haul Truck Driver; Moving Van Driver; Tow Truck Driver; Truck Driver; Truck Driver – Heavy Truck; Truck Driver – Tractor-trailer.

Typical employers: trucking companies; construction site maintenance firms.

Selected Main Duties

Truck drivers perform some or all of the following duties:

- Operate and drive straight or articulated trucks weighing over 4,600 kg with three or more axles to transport goods and material to destinations;
- Oversee all functions of vehicles, such as condition of equipment, loading and unloading, and safety and security of cargo;
- Obtain special permits and other documents required to transport cargo on international routes;
- Record cargo information, distance traveled, fuel consumption and other information in log book or on on-board computer;
- Receive and relay information to central dispatcher;
- Drive as part of a team or convoy;
- Transport hazardous products or dangerous goods;
- Drive lighter, special purpose trucks.

Working environment: Long distance drivers can spend long periods of time away from home. Partner arrangements are often used for long distance driving. Wages in the highway transport field reflect the submarkets and vary depending on the type of vehicle driven and length of routes. Truck drivers generally work without direct supervision. The number of hours a driver may drive in a given period is subject to regulation. Overtime and weekend work is, however, common.

Education/Training

Some secondary school education is usually required. On-the-job training may be provided. With few exceptions, no operating authority will be granted without a Certificate of Competency. The competency test can be taken at any Ontario Ministry of Transportation Driver Examination Centre. A driver's license appropriate to the class of vehicle being driven is required and a good driving record is also necessary to obtain employment. Air brake endorsement is required for drivers who operate vehicles equipped with air brakes. Drivers who transport hazardous products or dangerous goods must be certified by employers. Inability to cross international borders limits career opportunities.

Some truckers enter this occupation by first working as yard workers, dock handlers, checkers, clerks or other entry-level jobs with a motor transport company or private trucking company. Once some truck driving experience has been acquired, drivers with the necessary training and qualifications may be assigned to long haul or highway driving.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Some employers have reported difficulties in finding qualified workers to fill vacant positions.

While the skill requirements related to driving will not change greatly, the physical burdens placed on the driver will be reduced through improvements in ride quality, vehicle controls, heating, ventilation, air conditioning, visibility, noise and other driver amenities. Changes in truck technology will mean that trucks will be more "user friendly" and easier to drive. Technology is also changing the nature of the driver's job. On-board electronics have added some monitoring and recording duties to the driver's tasks. As the operation of computer-controlled equipment increasingly becomes more of a job requirement, drivers will need to become computer literate.

Most trucking firms advertise in newspapers and in government employment agencies. Applying directly to firms in the trucking industry is also a good method of finding work.

Characteristics of Occupation

Estimated Employment in 2000: 93,900

	(%)
Male	98
Female	2
Full-time	93
Part-time	7
Self-employed	12
Employees	88
Working away from home	70
Working at home	4
No fixed workplace address	26

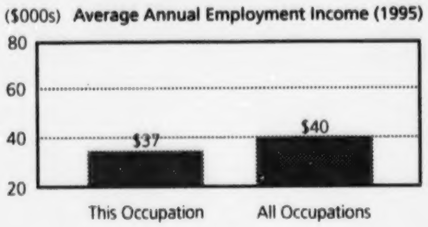
Employment by Region

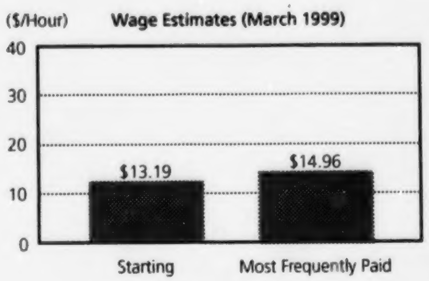
	(%) This Occupation	*(%) All Occupations*
Ottawa	8	10
Kingston-Pembroke	4	4
Muskoka-Kawarthas	4	3
Kitchener-Waterloo-Barrie	12	9
Hamilton-Niagara Peninsula	13	11
Toronto	29	42
London	7	5
Windsor-Sarnia	7	5
Stratford-Bruce Peninsula	4	3
Northeast	7	5
Northwest	4	2

Main Industries of Employment

	(%)
Transportation	59
Manufacturing	11
Wholesale trade	9

Income and Wages





For more information

Ontario Trucking Industry Training Council (www.otitc.com)
Ontario Trucking Association (www.ontruck.org)
Canadian Trucking Human Resources Council (www.cthrc.com)
Ministry of Transportation (www.mto.gov.on.ca)

7421 Heavy Equipment Operators (Except Crane)

Description

Heavy equipment operators operate heavy equipment used in the construction and maintenance of roads, bridges, airports, gas and oil pipelines, tunnels, buildings and other structures; in surface mining and quarrying activities; and in material handling work. Some heavy equipment operators may specialize in one or more types of equipment.

Common job titles: Backhoe Operator; Bulldozer Operator; Excavator Operator; Gradall Operator; Grader Operator; Heavy Equipment Operator; Loader Operator; Side Boom Tractor Operator.

Typical employers: construction site maintenance firms; highway and heavy construction firms; residential building developers; municipal governments; service firms to transportation companies; quarry companies; primary steel producers; building construction firms; mining companies.

Selected Main Duties

Heavy equipment operators perform some or all of the following duties:

- Operate heavy equipment such as backhoes, bulldozers, loaders and graders to excavate, move, load and grade earth, rock, gravel or other materials during construction and related activities;
- Operate bulldozers or other heavy equipment to clear brush and stumps prior to logging activities and to build roads at logging and surface mining sites;
- Operate heavy equipment with pile driver head to drive piling into earth to provide support for buildings or other structures;
- Operate heavy dredging equipment to deepen waterways or reclaim earth fill;
- Operate heavy paving and surfacing equipment to lay, spread or compact concrete, asphalt and other surface materials during highway and road construction;
- Operate power shovels to excavate rock, ore or other materials from open-pit mines, strip mines, quarries or construction pits;
- Operate heavy equipment to move, load and unload cargo;
- Conduct pre-operational checks on equipment and clean, lubricate and refill equipment.

Working environment: Aside from operating the machines, operators often perform routine maintenance and minor repairs. Much of the work is done on construction sites or on roadways in all types of weather. A five-day, 40-hour workweek is typical, but meeting deadlines will result in overtime hours.

Education/Training

Completion of a one to two-year apprenticeship program or some high school, college or industry courses in heavy equipment operating combined with on-the-job training are required. Internal company certification may be required by some employers.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. In addition to employment growth, many job openings will become available because of the need to replace experienced workers who retire.

Employment prospects for heavy equipment operators depends largely on the growth of the various industries that employ them – construction, manufacturing, transportation and mining. On the other hand, technological change continues to make heavy equipment operating less labour intensive. For example, in the mining industry, equipment can be operated from a remote station miles from the mine site.

Characteristics of Occupation

Estimated Employment in 2000: 19,100

	(%)
Male	99
Female	1
Full-time	95
Part-time	5
Self-employed	5
Employees	95
Working away from home	64
Working at home	3
No fixed workplace address	33

Employment by Region

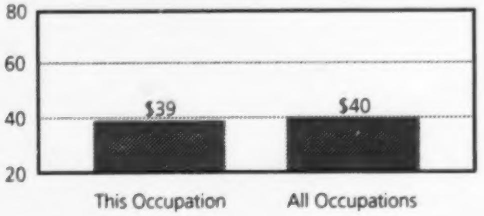
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	6	4
Muskoka-Kawarthas	5	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	13	11
Toronto	19	42
London	5	5
Windsor-Sarnia	5	5
Stratford-Bruce Peninsula	5	3
Northeast	15	5
Northwest	8	2

Main Industries of Employment

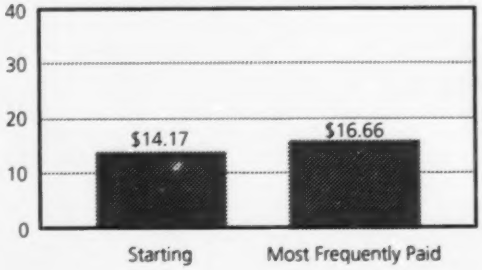
	(%)
Construction	57
Manufacturing	10
Wholesale trade	10
Mining	7

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Construction Transportation Industrial, Skills Training Services Inc. (www.ctiskillstraining.com)
Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/appren.html)

8251 Farmers and Farm Managers

Description

Farmers and farm managers manage the operations and functions of a farm. They are responsible for growing crops, raising and breeding livestock, poultry and other animals and marketing farm products. Farmers and farm managers may manage farms that specialize in particular crops such as wheat, apples or potatoes or raise particular livestock such as beef cattle, hogs or chickens.

Common job titles: Apple Grower; Dairy Farmer; Fur Farmer; Market Gardener; Hog Breeder.

Typical employers: farms; agricultural companies; self-employment.

Selected Main Duties

Farmers and farm managers perform some or all the following duties:

- Manage the overall operation of a farm, ranch or orchard;
- Determine amount and kinds of crops to be grown and livestock to be raised;
- Plant, cultivate and harvest crops;
- Raise and breed livestock and poultry;
- Hire and supervise farm workers;
- Establish a marketing program;
- Purchase farm machinery, livestock, seed, feed and other supplies;
- Maintain farm machinery, equipment and buildings;
- Develop and keep financial and production records.

Working environment: Farming is a strenuous job. Although mechanization has reduced some of the manual labour, a farmer must always be present to ensure that the machinery is working, animals are cared for, stalls and pens are cleaned and that the crops are being handled properly. The workload for crop farmers is considerably more seasonal.

Education/Training

Extensive farming experience (obtained as a farmer, farm supervisor or specialized livestock worker or by working on a family farm) is usually required. A college diploma in agriculture may be required for farm managers.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through 2005. The overwhelming majority of job openings will occur from replacement needs as older farmers retire.

The long-term trend toward a smaller number of larger farms results in fewer employment opportunities for this occupational group. This trend is still continuing. Increasing productivity in the highly efficient agricultural production industry is expected to meet domestic and export requirements for food with fewer farmers and farm managers. For the most part, farmers are self-employed.

Changes occurring in the industry are raising the skill levels required. Farms and farm managers are increasingly required to have training in management, human resources, farm technology, marketing, communications and financial skills. Increasing adoption of biotechnology and computerized systems will require farm managers to acquire skills in these areas.

Characteristics of Occupation

Estimated Employment in 2000: 66,000

	(%)
Male	73
Female	27
Full-time	82
Part-time	18
Self-employed	66
Employees	34
Working away from home	13
Working at home	86
No fixed workplace address	1

Employment by Region

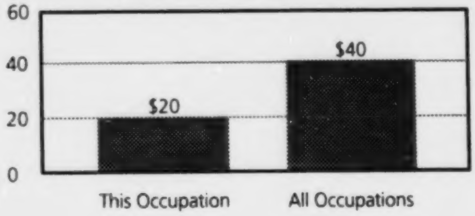
	(%) This Occupation	*(%) All Occupations*
Ottawa	11	10
Kingston-Pembroke	7	4
Muskoka-Kawarthas	5	3
Kitchener-Waterloo-Barrie	13	9
Hamilton-Niagara Peninsula	12	11
Toronto	7	42
London	13	5
Windsor-Sarnia	11	5
Stratford-Bruce Peninsula	17	3
Northeast	3	5
Northwest	1	2

Main Industries of Employment

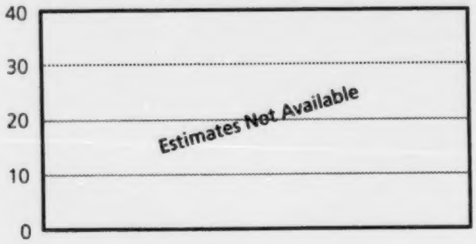
	(%)
Agriculture	100

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Dairy Farmers of Ontario (www.milk.org)
Agriculture and Agri-Food Canada (www.agr.ca)
Canadian Federation of Agriculture (www.cfa-fca.ca)
Ontario Agricultural Training Institute (www.oati.com)

8254 Nursery and Greenhouse Operators and Managers

Description

Nursery and greenhouse operators and managers plan, organize, direct and control the activities of nursery and greenhouse staff who grow and market trees, shrubs, flowers and plants.

Common job titles: Flower Grower; Nursery Farmer; Plant Grower.

Typical employers: agricultural companies; florists; lawn and garden centres; service firms to agriculture.

Selected Main Duties

Nursery and greenhouse operators and managers perform some or all of the following duties:

- Plan, organize, direct and control the operations of nurseries and greenhouses;
- Establish the environmental conditions required to grow trees, shrubs, flowers and plants;
- Determine type and quantity of stock to grow;
- Supervise staff in planting, transplanting, feeding and spraying stock;
- Develop marketing plans;
- Provide information to customers on gardening and on the care of trees, shrubs, flowers, plants and lawns;
- Order materials such as fertilizer, garden and lawn care equipment, and other nursery and greenhouse related accessories;
- Hire and supervise staff, oversee training and set work schedules;
- Maintain records on stock, finances and personnel.

Working environment: Work may be physically demanding, but supervisory positions generally require less physical activity than other greenhouse and nursery workers.

Education/Training

Completion of a college or apprenticeship program in horticulture is usually required. Operators and managers require experience as a nursery or greenhouse supervisor.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to increase more slowly than the average for all occupations through 2005 as greenhouses and nurseries are increasingly becoming large scale, automated operations. This occupation attracts many part-time workers and demands hard physical labour.

At the retail level, the popularity in gardening as a leisure activity has also boosted employment opportunities. Increasing adoption of biotechnology and computerized systems applied in farming are also a factor in greenhouse and nursery operations and which require operators to learn new skills.

Characteristics of Occupation

Estimated Employment in 2000: 2,500

	(%)
Male	54
Female	46
Full-time	78
Part-time	22
Self-employed	35
Employees	65
Working away from home	55
Working at home	41
No fixed workplace address	4

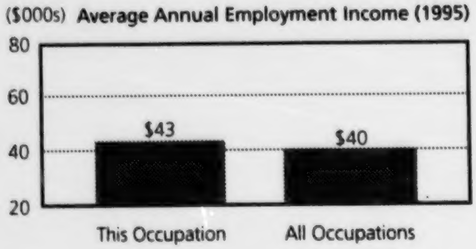
Employment by Region

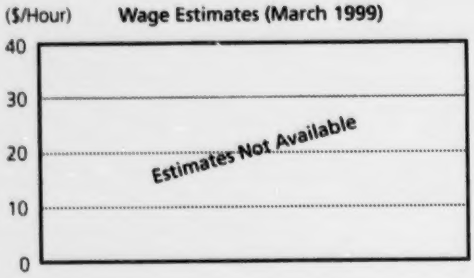
	(%) This Occupation	*(%) All Occupations*
Ottawa	9	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	7	9
Hamilton-Niagara Peninsula	34	11
Toronto	17	42
London	6	5
Windsor-Sarnia	9	5
Stratford-Bruce Peninsula	4	3
Northeast	6	5
Northwest	4	2

Main Industries of Employment

	(%)
Agricultural services	79
Retail trade	13

Income and Wages





For more information

Agricultural Institute of Canada (www.aic.ca)
Canadian Federation of Agriculture (www.cfa-fca.ca)
Canadian Nursery Landscape Association (www.canadanursery.com)
Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/service.html)

8255 Landscaping and Grounds Maintenance Contractors and Managers

Description

Landscaping and grounds maintenance contractors and managers plan, organize, direct and control the operations of landscaping, interior plantscaping, lawn care and tree service departments and establishments.

Common job titles: Grounds Maintenance Contractor; Grounds Maintenance Manager; Landscape Service Contractor; Lawn Care Manager; Tree Service Contractor.

Typical employers: construction site maintenance firms; services to buildings and dwellings; agricultural companies; service firms to agriculture.

Selected Main Duties

Landscaping and grounds maintenance contractors and managers perform some or all of the following duties:

- Plan, organize, direct and control the operations of landscaping, interior plantscaping, lawn care and tree service establishments;
- Tender bids on contracts for landscaping and grounds maintenance work;
- Plan and estimate the materials and labour requirements for individual contracts;
- Organize and direct the planting and maintenance of trees, gardens, lawns, shrubs and hedges and the construction and installation of fences, decks, patios, walkways and retaining walls;
- Hire and supervise staff;
- Maintain financial and personnel records.

Working environment: A considerable portion of working time is spent outdoors. Regular hours are the norm; however, growing season patterns require some fluctuation in work intensity and hours of work.

Education/Training

A college diploma or specialized courses in landscaping and horticulture are usually required. Apprenticeship program for horticulturists is also available in Ontario. Experience as a landscape or horticulture supervisor or as a landscape or horticulture technician is required for managers.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005 in response to increasing demand for landscaping, groundskeeping and related services.

Expected growth in the construction of commercial and industrial buildings, shopping malls, homes, highways and recreational facilities, which require the services of a landscape contractor, should contribute to the demand for these workers. There may also be an increase in demand for grounds maintenance services arising from an ageing population in the years ahead. This occupational group attracts many part-time workers and demands hard physical labour.

Characteristics of Occupation

Estimated Employment in 2000: 8,100

	(%)
Male	90
Female	10
Full-time	79
Part-time	21
Self-employed	46
Employees	54
Working away from home	35
Working at home	20
No fixed workplace address	45

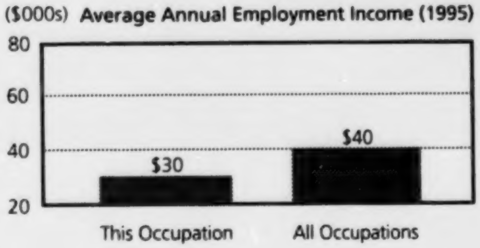
Employment by Region

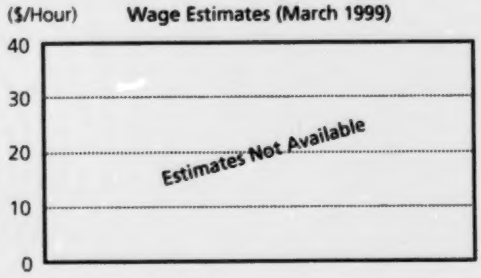
	(%) This Occupation	*(%) All Occupations*
Ottawa	10	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	4	3
Kitchener-Waterloo-Barrie	14	9
Hamilton-Niagara Peninsula	8	11
Toronto	39	42
London	8	5
Windsor-Sarnia	6	5
Stratford-Bruce Peninsula	3	3
Northeast	4	5
Northwest	2	2

Main Industries of Employment

	(%)
Trade contracting	59
Other service	26
Agriculture	7

Income and Wages


($000s) Average Annual Employment Income (1995)


($/Hour) Wage Estimates (March 1999)

For more information

Agriculture and Agri-Food Canada (www.agr.ca)
Canadian Nursery Landscape Association (www.canadanursery.com)
Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/service.html)

9234 Papermaking and Coating Control Operators

Description

Papermaking and coating control operators operate and monitor multi-function process control machinery and equipment to control the processing of paper, paper pulp and paperboard.

Common job titles: Back Tender, Paper Machine; Fourdrinier Machine Operator; Panelboard Operator, Pulp and Paper; Control Operator, Paper Machine.

Typical employers: pulp and paper companies; converted paper products companies; logging companies; paper box and bag makers; commercial printing firms.

Selected Main Duties

Papermaking and coating control operators perform some or all of the following duties:

- Operate, co-ordinate and monitor the operation of papermaking and papercoating process equipment from a central control room or from machine consoles and control panels in equipment cabins to make paper from pulp stock, mix chemicals and dyes, and coat paper products;
- Control process operations and machinery using a distributed control system and process computers;
- Observe panel indicators, gauges, video monitors and other instruments to detect equipment malfunctions and ensure papermaking and coating processes are operating according to process specifications;
- Analyse instrument readings and production test samples and make adjustments or direct other papermaking and finishing machine operators to make adjustments to papermaking and coating process and equipment as required;
- Complete and maintain production reports.

Working environment: Traditionally these jobs have been physically demanding and not without health risks due to the many toxic chemicals used in the papermaking process. The increased use of electronic technology is tending to make these jobs somewhat cleaner and less physically demanding.

Education/Training

Employment in this area may require the following combination of education, experience or other attributes: completion of secondary school, completion of several weeks of formal company training and several months of on-the-job training. Also, several years experience as a papermaking and finishing machine operator within the same company is usually required. Certificate in industrial first aid and competency certificate in natural gas may also be required. There is limited mobility among jobs within this occupational group but progression to supervisory positions is possible with experience.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow slower than the average for all occupations through the year 2005.

The role of workers in the pulp and paper industry is to organize the flow of materials and by so doing to enable machines to make and coat paper. Many of Ontario's mills have upgraded their operations over the past several years and are producing a wider range of improved products. Computer-integrated systems and advanced manufacturing technologies are increasing the level of computer skills needed by these operators.

Characteristics of Occupation

Estimated Employment in 2000: 1,200

	(%)
Male	86
Female	14
Full-time	97
Part-time	3
Self-employed	1
Employees	99
Working away from home	98
Working at home	1
No fixed workplace address	1

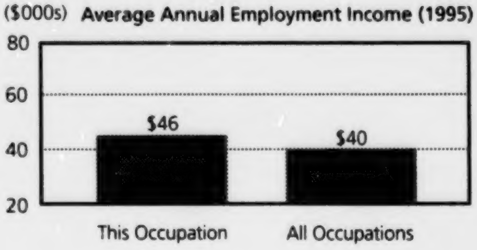
Employment by Region

	(%) This Occupation	*(%) All Occupations*
Ottawa	1	10
Kingston-Pembroke	5	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	5	9
Hamilton-Niagara Peninsula	15	11
Toronto	25	42
London	1	5
Windsor-Sarnia	0	5
Stratford-Bruce Peninsula	0	3
Northeast	14	5
Northwest	33	2

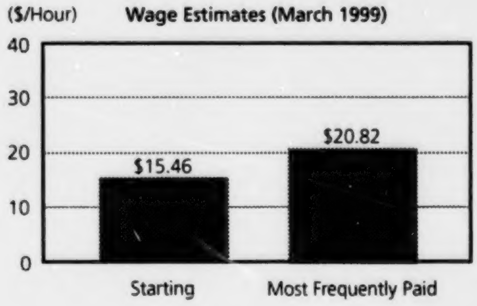
Main Industries of Employment

	(%)
Paper and allied products	93

Income and Wages



Average Annual Employment Income (1995)



Wage Estimates (March 1999)

For more information

Canadian Pulp and Paper Association (www.open.doors.cppa.ca)

9422 Plastics Processing Machine Operators

Description

Plastics processing machine operators set up and operate plastic mixing, calendering, extruding and moulding processing machines used in the manufacture of plastic parts and plastic products.

Common job titles: Bag Machine Operator; Blow Moulding Machine Operator; Extruder Operator – Rubber and Plastic Manufacturing; Injection Moulding Operator; Plastics Press Operator.

Typical employers: plastic products companies; foamed and expanded plastic products firms; motor vehicle parts manufacturers; plastic and synthetic resin manufacturers; plastic pipe and pipe fittings companies; manufacturing companies; hardware, tool and cutlery manufacturers; plastic film and sheeting firms.

Selected Main Duties

Mixing machine operators perform some or all of the following duties:

- Weigh resins, colorants and other chemicals according to formulae;
- Place weighed materials in mixing machine and operate machine to blend plastic and other chemicals to a specified consistency or viscosity;
- Unload mixture into container or conveyor for further processing.

Calendering process operators perform some or all of the following duties:

- Set up and operate calender machines which transform plastic bales or slabs into continuous plastic sheets or films of specified thickness;
- Troubleshoot and make minor adjustments to equipment and adjust calender rollers for production line change;
- Monitor quality of material produced.

Extruding process operators perform some or all of the following duties:

- Set up and operate extruding machines which extrude plastic compound through a nozzle or a die;
- Change dies on extruding machines according to production line change;
- Troubleshoot and make minor adjustments to equipment;
- Monitor quality of material produced.

Moulding process operators perform some or all of the following duties:

- Set up and operate one or more moulding machines which mould plastic products according to specifications;
- Change moulds and adjust equipment for production line change;
- Troubleshoot and make minor adjustments to equipment;
- Monitor quality of material produced;
- Follow formulation card to mix resin batches for injection moulding process.

Working Environment: Workers operate powerful, high-speed machinery that poses dangers if the proper precautions are not taken. A 40-hour workweek is most common, but overtime is necessary in times of increased production. Shift work is common. Physical activity may be light, moderate or heavy.

Education/Training

Employment in this area may require a combination of education, experience or other attributes. Completion of secondary school may be required. On-the-job training is necessary and several years of experience as a helper, tender or packer in the same company may be required. Completion of a statistical process control (SPC) course may be required. For moulding process operators, completion of courses in hydraulics, pneumatics and electronics systems may be required. Progression to supervisory positions is possible with experience. Mobility among the various operators in this unit is possible.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through 2005. Many job openings will be created each year from the need to replace workers who retire.

Employment growth in this occupation has been affected by the implementation of labour-saving new technologies, such as computer-controlled machine tools to improve quality and lower production costs. Computer-controlled equipment allows operators to simultaneously tend a greater number of machines and often makes setup easier, thereby eliminating the lower-skilled positions of manual machine tool operators and tenders. Increasing use of computerized equipment in this occupational group could improve prospects for new entrants with appropriate education or experience.

Characteristics of Occupation

Estimated Employment in 2000: 18,100

	(%)
Male	63
Female	37
Full-time	94
Part-time	6
Self-employed	0
Employees	100
Working away from home	99
Working at home	0
No fixed workplace address	1

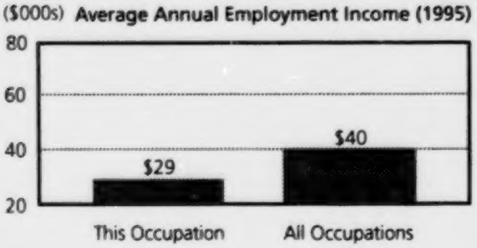
Employment by Region

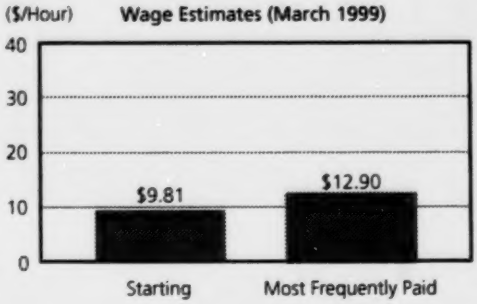
	(%) This Occupation	*(%) All Occupations*
Ottawa	3	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	5	3
Kitchener-Waterloo-Barrie	17	9
Hamilton-Niagara Peninsula	7	11
Toronto	53	42
London	3	5
Windsor-Sarnia	8	5
Stratford-Bruce Peninsula	2	3
Northeast	1	5
Northwest	0	2

Main Industries of Employment

	(%)
Plastic products	65
Transportation equipment	13
Chemical and chemical products	7

Income and Wages





For more information

Canadian Plastics Industry Association (www.plastics.ca)

Glass, Moulders, Pottery, Plastics and Allied Workers (www.gmpiu.org)

9451 Sewing Machine Operators

Description

Sewing machine operators operate sewing machines to sew fabric, fur, leather or synthetic materials to produce or repair garments and other articles.

Common job titles: Leather Products Sewing Machine Operator; Lining Stitcher; Sample Maker; Shoe Sewer.

Typical employers: men's and women's clothing companies; leather product companies; textile firms; motor vehicle parts manufacturers; personal and household service firms; motor vehicle manufacturers; women's clothing stores.

Selected Main Duties

Sewing machine operators perform some or all of the following duties:

- Operate single, double or multi-needle sewing machines to join sections of garments or other articles into finished products on a piece-work or production basis;
- Operate fur sewing machines to join fur pelt strips to required size and shape and join pelts into garment sections or shells;
- Operate stitching machines to sew leather parts together for leather garments, handbags, shoes and other leather articles;
- Operate serging machines to sew and overcast edges of material simultaneously;
- Operate tackers, button hole makers and fusing, hammer and other machines to perform various operations in the fabrication of garments and other articles;
- Operate sewing machines, sergers and other machines to repair garments and other articles during the manufacturing process.

Working environment: Working conditions for sewing machine operators vary by establishment and by the specific sewing machine used. Modern facilities are well lighted and ventilated. Sewing and pressing areas tend to be noisy. A standard 5-day, 40-hour workweek is the norm, although overtime is sometimes necessary to meet deadlines. Operators must be attentive while using sewing machines.

Education/Training

Employment in this area may require some secondary school education and experience operating a sewing machine. On-the-job training may be provided.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to decline through 2005. Despite this, a sizeable number of job openings will occur as older workers retire.

The apparel industry has undergone significant restructuring and modernization in the face of increasing international competitive pressures. The trend is toward a smaller and more versatile workforce with higher skills to utilize new technology. The trend toward modular team production processes may lead to sewing machine operators interacting with one another more than they have in the past. They may desire training in team building and oral communication to prepare for this new environment.

Characteristics of Occupation

Estimated Employment in 2000: 26,600

	(%)
Male	8
Female	92
Full-time	88
Part-time	12
Self-employed	7
Employees	93
Working away from home	90
Working at home	9
No fixed workplace address	1

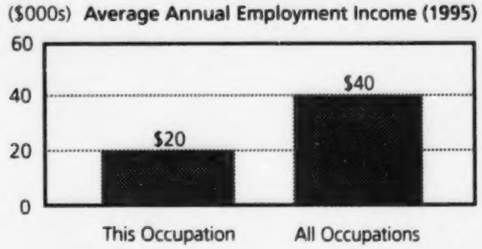
Employment by Region

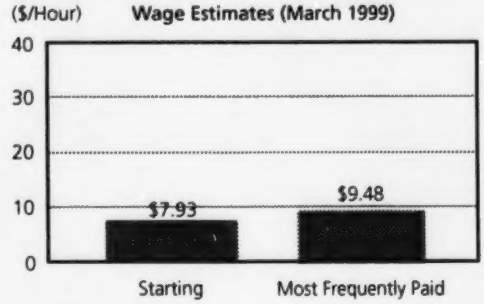
	(%) This Occupation	*(%) All Occupations*
Ottawa	7	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	13	9
Hamilton-Niagara Peninsula	9	11
Toronto	56	42
London	3	5
Windsor-Sarnia	4	5
Stratford-Bruce Peninsula	4	3
Northeast	1	5
Northwest	0	2

Main Industries of Employment

	(%)
Clothing manufacturers	52
Transportation equipment	8
Retail trade	5

Income and Wages





For more information

Canadian Apparel Federation (www.apparel.ca)

Apparel Human Resources Council (www.apparel-hrc.org)

9481 Aircraft Assemblers and Aircraft Assembly Inspectors

Description

Aircraft assemblers assemble, fit and install pre-fabricated parts to manufacture fixed wing or rotary wing aircraft or aircraft sub-assemblies. Aircraft assembly inspectors inspect aircraft assemblies for adherence to engineering specifications.

Common job titles: Aircraft Assembler; Airframe Assembler, Bench Fitter Mechanic; Rigger – Aircraft Assembly.

Typical employers: aircraft and parts manufacturers; airline companies.

Selected Main Duties

Aircraft assemblers perform some or all of the following duties:

- Read and interpret aircraft assembly diagrams;
- Assemble and fit pre-fabricated parts to form sub-assemblies, working at benches or directly on an aircraft structure;
- Assemble, fit and install pre-fabricated parts and sub-assemblies such as aircraft skins, flight controls, rigging, hydraulics and other mechanical systems.

Aircraft assembly inspectors perform some or all of the following duties:

- Inspect aircraft assemblies, using measuring and testing equipment, for adherence to engineering specifications;
- Inspect assemblies for alignment, symmetry, dimensions, fit and quality of workmanship;
- Complete detailed inspection documentation.

Working environment: Workers in this occupation are usually employed in a manufacturing-plant environment.

Education/Training

Employment in this area may require a combination of education, experience or other attributes. Completion of secondary school is required. Completion of a college or other program in aviation or aeronautical technology, with emphasis in aircraft manufacturing, may be required. Aircraft assemblers receive several months of on-the-job and classroom training. Aircraft assembly inspectors require experience as an aircraft assembler.

Employment Prospects

Over the next five years: Limited

Employment for this occupation is expected to decline through 2005, with most job openings occurring as older workers retire. However, employment in the aircraft and parts manufacturing industry is directly related to the awarding of contracts for production of new aircrafts. This sector is in the forefront of innovation which leads to increased skills required of the workforce.

Increased regulation of the aircraft design and assembly will place more intensive textual reading requirements on aircraft assemblers and aircraft assembly inspectors. They will need to update their computer skills as more and more documents that they presently view in paper copy are made available on the computer.

Characteristics of Occupation

Estimated Employment in 2000: 2,600

	(%)
Male	88
Female	12
Full-time	97
Part-time	3
Self-employed	1
Employees	99
Working away from home	98
Working at home	1
No fixed workplace address	1

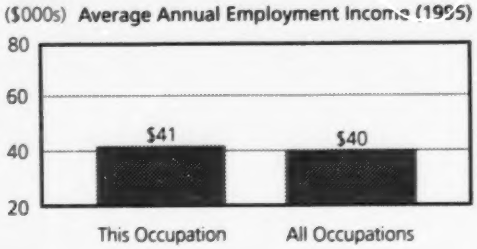
Employment by Region

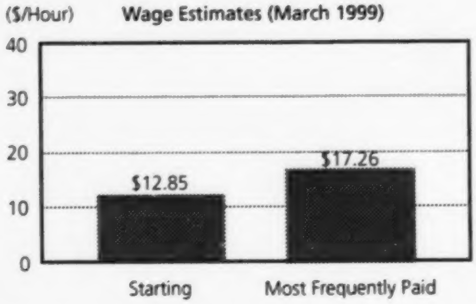
	(%) This Occupation	*(%) All Occupations*
Ottawa	1	10
Kingston-Pembroke	3	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	11	9
Hamilton-Niagara Peninsula	8	11
Toronto	69	42
London	4	5
Windsor-Sarnia	1	5
Stratford-Bruce Peninsula	1	3
Northeast	0	5
Northwest	0	2

Main Industries of Employment

	(%)
Transportation equipment	93

Income and Wages





For more information

Aerospace Industries Association of Canada (www.aiac.ca)
Canadian Aeronautics and Space Institute (www.casi.ca)
Canadian Space Agency (www.space.gc.ca)

9482 Motor Vehicle Assemblers, Inspectors and Testers

Description

Motor vehicle assemblers assemble and install prefabricated motor vehicle parts and components to form sub-assemblies and finished motor vehicles. Motor vehicle inspectors and testers inspect and test parts, sub-assemblies and finished products to ensure proper performance and conformity to quality standards.

Common job titles: Auto Assembly Worker; Chassis Inspector; Light Truck Assembler; Transmission Installer.

Typical employers: motor vehicle manufacturers; motor vehicle parts manufacturers.

Selected Main Duties

Motor vehicle assemblers perform some or all of the following duties:

- Bolt, screw, clip, weld, solder or otherwise fasten motor vehicle parts and components together using hand and power tools and equipment;
- Operate and tend automated assembling equipment such as robotics and fixed automation equipment;
- Connect cables, tubes and wires to complete assemblies and installations;
- Position and install parts and sub-assemblies such as engines, transmissions, door panels or instrument panels using hand and power tools and other aids like overhead hoists;
- Fit and adjust parts such as doors, hoods and trunk lids.

Motor vehicle inspectors and testers perform some or all of the following duties:

- Check motor vehicle exterior priming and colour coats, sealers and glazers and mark defects to be repaired;
- Test motor vehicle electrical assemblies, equipment and wiring for proper performance using testing devices such as meters, analysers and timing lights;
- Inspect fully assembled motor vehicles for defects and to ensure that previously noted defects have been corrected;
- Drive and test motor vehicles on roll testing device to ensure that transmission, axle, engine and brakes function properly;
- Record and report motor vehicle defects.

Working environment: A factory environment is typical with repetitive physical activity.

Education/Training

Completion of secondary school is usually required. Skills required for occupations in this group are normally acquired through on-the-job training. However, the major firms now undertake significant aptitude testing of most applicants.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Replacement needs are expected to create a substantial number of job openings yearly, due to the large size of this occupational group.

The motor vehicle industry continues to undergo rapid technological change. The use of robotics and computer-controlled equipment on the assembly line continues to grow. Workers will need to demonstrate an aptitude in working with these and other high technology applications in motor vehicle assembly. In addition, emphases on improving vehicle performance and quality control are putting a premium on literacy skills to read computer print-outs and effective teamwork to work as part of a reconfigured production process.

Characteristics of Occupation

Estimated Employment in 2000: 61,100

	(%)
Male	72
Female	28
Full-time	95
Part-time	5
Self-employed	0
Employees	100
Working away from home	99
Working at home	0
No fixed workplace address	1

Employment by Region

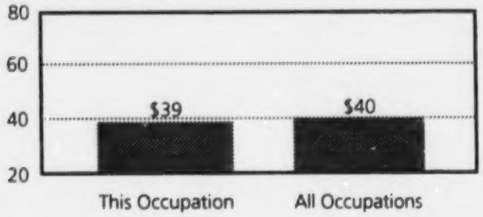
	(%) This Occupation	*(%) All Occupations*
Ottawa	0	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	5	3
Kitchener-Waterloo-Barrie	10	9
Hamilton-Niagara Peninsula	11	11
Toronto	33	42
London	13	5
Windsor-Sarnia	25	5
Stratford-Bruce Peninsula	2	3
Northeast	0	5
Northwest	0	2

Main Industries of Employment

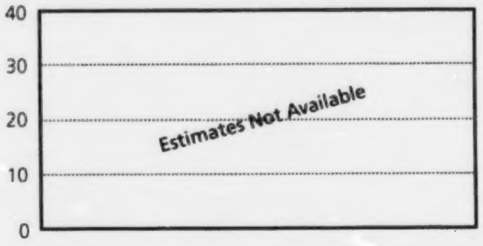
	(%)
Transportation equipment	93

Income and Wages

($000s) Average Annual Employment Income (1995)



($/Hour) Wage Estimates (March 1999)



For more information

Canadian Vehicle Manufacturers' Association (www.cvma.ca)
Association of International Automobile Manufacturers, Inc. (www.aiam.org/98toc.htm)
Automotive Parts Manufacturers' Association (www.capma.com)

9483 Electronics Assemblers, Fabricators, Inspectors and Testers

Description

Electronics assemblers and fabricators assemble and fabricate electronic equipment, parts and components. Electronics inspectors and testers inspect and test electronic and electromechanical assemblies, sub-assemblies, parts and components to ensure conformance to prescribed standards.

Common job titles: Capacitor Assembler; Circuit Board Assembler; Component Inserting Machine Operator; Tester – Electronic Components; Wiring and Assembly Operator.

Typical employers: electronic equipment manufacturers; business machine manufacturers; electrical industrial equipment manufacturers; electrical and electronic machinery and equipment wholesalers; computer service firms; motor vehicle parts manufacturers; electrical products manufacturers.

Selected Main Duties

Electronics assemblers perform some or all of the following duties:

- Solder and manually assemble various electronic components such as resistors, diodes, transistors, capacitors, integrated circuits, wires and other electronic parts to designated locations on printed circuit boards;
- Assemble microcircuits requiring fine hand assembly, the use of microscopes and adherence to clean room procedures;
- Install, mount, fasten, align and adjust parts, components, wiring and harnesses to sub-assemblies and assemblies using hand and small power tools;
- Operate automatic and semiautomatic machines to position, solder and clean prescribed components on printed circuit boards.

Electronics fabricators perform some or all of the following duties;

- Operate and monitor process equipment including automatic and semi-automatic machines to fabricate electronic components, solder, clean, seal and stamp components and perform other process operations as specified;
- Set up process equipment and adhere to clean room procedures as required.

Electronics inspectors perform some or all of the following duties:

- Inspect electronic components and assemblies while products are being assembled or fabricated;
- Check final assembly for finish, labelling and packaging methods;
- Check mechanical dimensions and perform "go-no-go" electrical tests;
- Identify and mark acceptable and defective assemblies and return faulty assemblies to production for repair;
- Collect, record and summarize inspection results.

Electronics testers perform some or all of the following duties:

- Operate various test equipment and tools to perform simple electrical and continuity testing of electronic components, parts and systems.

Working environment: Individuals in these occupations often work in a manufacturing environment where they are exposed to hazards requiring the use of safety equipment.

Education/Training

Employment in this area may require a combination of education, experience or other attributes. Some secondary school education is required for electronics assemblers, fabricators, inspectors and testers. Electronics testers may require post-secondary courses in basic electronic theory, testing techniques and testing equipment. Electronics inspectors and testers may require experience as an electronics assembler or component fabricator. Progression from electronics assembler or component fabricator to electronics inspector or tester is possible with additional training and experience.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through 2005.

Increasingly consumer demand for computers and other electronic equipment is met by manufacturing companies located throughout the world. In the production process, the introduction of new technologies will put a premium on those workers with good computer literacy skills to work with the new equipment.

Characteristics of Occupation

Estimated Employment in 2000: 20,500

	(%)
Male	44
Female	56
Full-time	92
Part-time	8
Self-employed	1
Employees	99
Working away from home	97
Working at home	2
No fixed workplace address	1

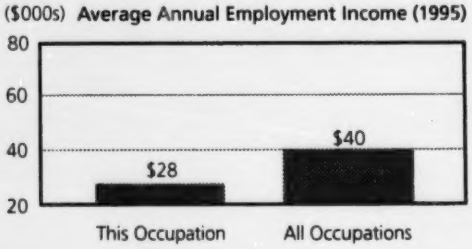
Employment by Region

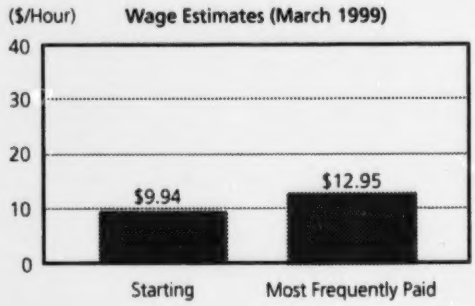
	(%) This Occupation	*(%) All Occupations*
Ottawa	19	10
Kingston-Pembroke	5	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	9	9
Hamilton-Niagara Peninsula	4	11
Toronto	55	42
London	3	5
Windsor-Sarnia	1	5
Stratford-Bruce Peninsula	1	3
Northeast	0	5
Northwest	0	2

Main Industries of Employment

	(%)
Electrical and electronic products	75
All other manufacturing	12

Income and Wages





For more information

Electro-Federation Canada (www.electrofed.com)
Canadian Electricity Association (www.canelect.ca)

9484 Assemblers and Inspectors, Electrical Appliance, Apparatus and Equipment Manufacturing

Description

Assemblers in this group assemble prefabricated parts to produce household, commercial and industrial appliances and equipment. Inspectors in this group inspect and test assembled products. Workers who set up and prepare assembly lines for operation are included in this unit group.

Common job titles: Assembler – Electrical Appliances; Circuit Breaker Assembler; Dishwasher Assembler; Inspector – Electrical Controls Assembly.

Typical employers: major appliance manufacturers; electric lighting manufacturers; electrical industrial equipment manufacturers; small electrical appliance manufacturers; machinery and equipment manufacturers; commercial refrigerator and air conditioner manufacturers.

Selected Main Duties

Assemblers perform some or all of the following duties:

- Assemble prefabricated parts on an assembly line or at work benches using screw guns and other hand and power tools;
- Assemble small and large household electrical appliances such as coffee-makers, toasters, vacuum cleaners, lawn mowers, refrigerators and dishwashers;
- Assemble small transformers, small electrical motors and transmissions used in appliances or other electrical products;
- Assemble circuit breakers, switches or other electrical control equipment and position and fasten components such as springs, toggles or other parts into assembly casings;
- Wind coils and armatures for small electric motors and transformers;
- Perform minor repairs to products rejected from production assembly line;
- Set up assembly line with materials and supplies required for production, and set up and adjust production tools.

Inspectors and *testers* perform some or all of the following duties:

- Check products at different stages of production for visual defects and faulty electrical and mechanical connections, or operate automatic or other testing equipment to ensure product quality;
- Identify and mark acceptable and defective assemblies and return faulty assemblies to production for repair;
- Collect, record and summarize inspection results.

Working environment: Individuals in these occupations often work in an electrical products manufacturing environment where they are exposed to hazards requiring the use of safety equipment.

Education/Training

Employment in this area may require a combination of education, experience or other attributes. Some secondary school education is usually required. On-the-job training is provided. Inspectors may require experience as an assembler in the same company. Some types of inspectors may require completion of an electronics college program. With experience, assemblers may progress to inspecting and testing positions. Progression to supervisory positions is possible with experience.

Employment Prospects

Over the next five years: Fair

Employment for this occupation is expected to grow more slowly than the average for all occupations through 2005. The implementation of new technology to automate the production process is contributing to slower growth in employment. Many job openings will be created each year from the need to replace workers who retire.

The industry is expected to increasingly adopt high-technology manufacturing processes, such as robotics and lasers, in order to remain competitive. This will likely place a new emphasis on acquiring new learning through formal training programs and increase the frequency and importance of reading text.

Characteristics of Occupation

Estimated Employment in 2000: 10,100

	(%)
Male	57
Female	43
Full-time	94
Part-time	6
Self-employed	1
Employees	99
Working away from home	98
Working at home	1
No fixed workplace address	1

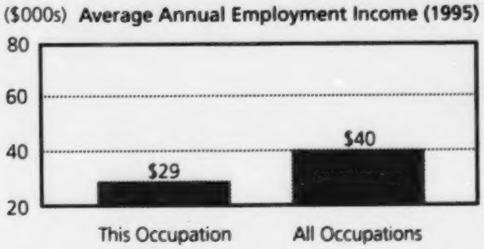
Employment by Region

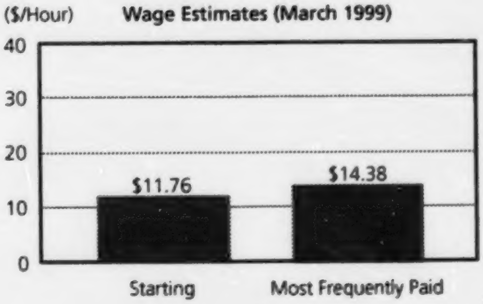
	(%) This Occupation	*(%) All Occupations*
Ottawa	6	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	20	9
Hamilton-Niagara Peninsula	18	11
Toronto	43	42
London	3	5
Windsor-Sarnia	1	5
Stratford-Bruce Peninsula	3	3
Northeast	1	5
Northwest	0	2

Main Industries of Employment

	(%)
Electrical and electronic products	65
Machinery	12

Income and Wages





For more information

Electro – Federation Canada (www.electrofed.com)
Canadian Electricity Association (www.canelect.ca)

9510 Welders and Soldering Machine Operators

Description

Workers in these occupations operate welding equipment to weld ferrous and non-ferrous metals. Required skill levels vary widely.

Common job titles: Aircraft Welder; Electric Arc Welder; Gas Shielded Arc Welder; Precision Welder; Pressure Vessel Welder; Welder Fitter; Brazier Operator; Brazing Machine Operator; Soldering Machine Operator; Spot Welder; Production Welder.

Typical employers: motor vehicle parts manufacturers; primary steel producers; motor vehicle manufacturers; machinery and equipment manufacturers; fabricated structural metal products producers; repair services.

Selected Main Duties

Welders perform some or all of the following duties:

- Read and interpret blueprints or welding process specifications;
- Operate manual or semiautomatic welding equipment to fuse metal segments using processes such as gas tungsten arc, gas metal arc, flux cored arc, plasma arc, shielded metal arc, resistance welding and submerged arc welding;
- Operate manual or semiautomatic flame cutting equipment;
- Operate brazing and soldering equipment;
- Operate metal shaping machines such as brakes, shears and other metal straightening and bending machines.

Welding machine operators and *brazing and soldering machine operators* perform some or all of the following duties:

- Welding machine operators operate previously set up welding machines such as spot, butt and seam resistance or gas and arc welding machines to fabricate or repair metal parts;
- Brazing and soldering machine operators operate previously set up brazing or soldering machines to bond metal parts or to fill holes, indentations and seams of metal articles with solder.

Working environment: Although production welders and flame cutting operators work primarily indoors, many welding positions call for work both indoors and outdoors. In construction, outdoor work is the norm. The physical demands of welding are heavy. Lifting and carrying heavy items are often required as are prolonged periods of standing and crouching. A welder is exposed to very hot temperatures, noise, fumes and dust. A normal workweek is five days of 37 to 40 hours, although shift work is not uncommon in this occupation.

Education/Training

Some secondary school education is usually required with Grade 12 being the norm for hiring skilled welders. Workers and job applicants must have a good knowledge of the basic settings on the welding machines, polarity, blue-print reading, etc. They must also have "hands-on" experience. Some employers, especially machinery manufacturers and pressure vessel manufacturers, require highly skilled welder-fitters for precision and very sophisticated work. SMAW (stick welding) is the most difficult type of welding, usually taught by these companies.

For the more highly skilled welding occupations, completion of an apprenticeship program or a combination of over three years of work experience in the trade and some college or industry courses in welding is usually required to be eligible for trade certification. Trade certification is available in Ontario.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow about as fast as the average for all occupations through the year 2005. Due to the large size of this occupational group, the majority of job openings, however, will result from the need to replace workers who retire. Demand will be greater for skilled welders as opposed to soldering machine operators.

Employment opportunities for welders and soldering machine operators are dependent upon the activity in the manufacturing sector. An increase in the use of automated and robotic welding techniques in manufacturing will result in a slower employment growth for welding machine operators, despite an expected increase in production. Manual welders, however, especially those with a wide variety of high level skills will still be required for sophisticated fabrication tasks and repair work that do not lend themselves to automation.

Characteristics of Occupation

Estimated Employment in 2000: 31,100

	(%)
Male	95
Female	5
Full-time	96
Part-time	4
Self-employed	3
Employees	97
Working away from home	92
Working at home	2
No fixed workplace address	6

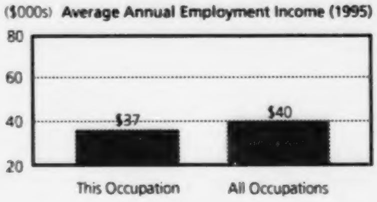
Employment by Region

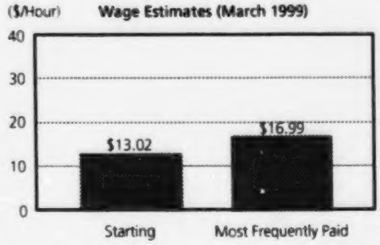
	(%) This Occupation	*(%) All Occupations*
Ottawa	4	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	3	3
Kitchener-Waterloo-Barrie	15	9
Hamilton-Niagara Peninsula	18	11
Toronto	31	42
London	7	5
Windsor-Sarnia	8	5
Stratford-Bruce Peninsula	3	3
Northeast	7	5
Northwest	3	2

Main Industries of Employment

	(%)
Fabricated metal products	20
Transportation equipment	20
Machinery	11
Other service	11
Construction	8
Primary metals	6

Income and Wages





For more information

Canadian Welding Bureau (www.cwbgroup.com)

Welding Canada (www.weldingcanadamag.com)

Ministry of Training, Colleges and Universities (www.edu.gov.on.ca/eng/training/apprenticeship/appren.html)

9511 Machining Tool Operators

Description

Machining tool operators set up and operate or tend metal-cutting machines designed for repetitive machining work. This group also includes workers who etch or chemically mill metal pieces.

Common job titles: Aircraft Parts Etcher; Boring Mill Operator; Lathe Machining Operator; Milling Machine Set-up Operator; Numerical Control (NC) Machine Tool Operator.

Typical employers: motor vehicle parts manufacturers; machine shops; motor vehicle manufacturers; machinery and equipment manufacturers; hardware, tool and cutlery manufacturers; primary steel producers; wire products manufacturers; aircraft and parts manufacturers; metal fabricating companies.

Selected Main Duties

Machining tool operators perform some or all of the following duties:

- Study job orders or interpret blueprints to determine machining operations to be performed;
- Operate and set up machines to perform repetitive machining operations, such as turning, milling, drilling, boring, planing, honing, broaching, grinding or other machining operations;
- Verify dimensions of parts machined using precision measuring instruments;
- Prepare etching solution and immerse metal parts or work-piece in etching solution to remove unwanted portions.

Working environment: A machining tool operator generally works indoors in areas that may be noisy and potentially hazardous. Frequent lifting and carrying may be required. A five-day workweek of 35 to 40 hours is typical. Shift work is not unusual.

Education/Training

Employment in this area may require a combination of education, experience or other attributes. Some secondary school education is required. College or other courses in machining may be required. Several months of on-the-job training are usually provided. Senior positions in this occupational group, such as set-up operator, require experience as a machine operator. Experienced machining tool operators may become machinists through apprenticeship training.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to increase much faster than the average for all occupations through the year 2005. Many employers report difficulties in finding qualified workers to fill vacant positions. Many job openings will be created each year from the need to replace workers who retire.

Employment growth in this occupational group is affected by the demand for the goods they produce and the rate of technological implementation. Greater use of computer-controlled machine tools and changes in production processes that combine production tasks and link machines may reduce the overall demand for machine operators over the longer term. However, employment growth will occur among NC machine operators and combination machine tool operators.

In the future, improvement in technology will continue to affect the tools and machines used by machining tool operators. There is a trend to linking numerical control machines to personal computers. The use of more sophisticated computer-controlled machines and heightened use of robotics will mean more machining tool operators will need to acquire or upgrade their computer skills.

Characteristics of Occupation

Estimated Employment in 2000: 9,600

	(%)
Male	88
Female	12
Full-time	95
Part-time	5
Self-employed	1
Employees	99
Working away from home	98
Working at home	1
No fixed workplace address	1

Employment by Region

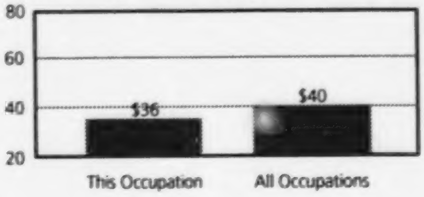
	(%) This Occupation	*(%) All Occupations*
Ottawa	1	10
Kingston-Pembroke	1	4
Muskoka-Kawarthas	1	3
Kitchener-Waterloo-Barrie	19	9
Hamilton-Niagara Peninsula	18	11
Toronto	37	42
London	7	5
Windsor-Sarnia	10	5
Stratford-Bruce Peninsula	4	3
Northeast	1	5
Northwest	0	2

Main Industries of Employment

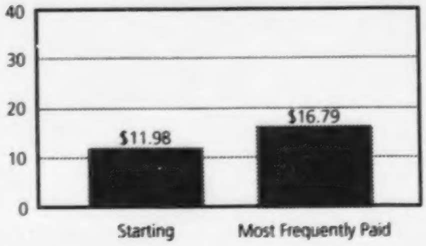
	(%)
Fabricated metal products	42
Transportation equipment	22
Machinery	14

Income and Wages

($000s) **Average Annual Employment Income (1995)**



($/Hour) **Wage Estimates (March 1999)**



For more information

Automotive Parts Manufacturers' Association (www.capma.com)

9514 Metalworking Machine Operators

Description

Light metalworking machine operators operate metalworking machines which shape and form sheet or other light metal into parts or products. Heavy metalworking machine operators operate metalworking machines which shape and form steel or other heavy metal into parts or products.

Common job titles: Brake Press Operator; Disk Flange Operator; Power Press Operator; Punch Press Operator; Vertical Press Operator.

Typical employers: motor vehicle parts manufacturers; primary steel producers; stamping press and coated metal products companies; motor vehicle manufacturers; hardware, tool and cutlery manufacturers; machinery and equipment manufacturers; metal fabricating companies; metal and metal products wholesalers; ornamental metal products producers.

Selected Main Duties

Metalworking machine operators perform some or all of the following duties:

- Read specifications or follow verbal instructions;
- Set up and operate one or more light or heavy metalworking machines such as shears, power presses, saws, platerolls, drills, brakes, slitters, punch press and CNC (computer numerically controlled) equipment to cut, bend, roll, ream, punch and drill, or otherwise shape and form metal stock into parts or products;
- Operate machines or equipment which weld, solder, bolt, screw or rivet metal parts together;
- Check products for correct shapes, dimensions and other specifications;
- Select and transport material to work area manually or using crane or hoist;
- Clean or lubricate equipment and replace parts as required.

Working environment: Metal machine operators generally work indoors in areas that may be noisy and potentially hazardous. A five-day workweek of 35 to 40 hours is typical. Shift work is not unusual.

Education/Training

Employment in this area may require a combination of education, experience or other attributes. Some secondary school education is required. On-the-job training is usually provided. Also, previous experience as a labourer or helper in the same company may be required. There is little mobility between operators of light and heavy metalworking machines. Progression to structural metal fabricator or supervisory positions is possible with experience.

Employment Prospects

Over the next five years: Good

Employment for this occupation is expected to grow more rapidly than the average for all occupations through the year 2005.

Increased use of computerized machinery in the production process will mean more metalworking machine operators will use computer skills. New technologies are reducing the amount of manual work in producing products. As a result, knowledge of the process is becoming increasingly important for operators. Quality control is also becoming an essential part of the operator's job.

Characteristics of Occupation

Estimated Employment in 2000: 34,500

	(%)
Male	81
Female	19
Full-time	97
Part-time	3
Self-employed	1
Employees	99
Working away from home	98
Working at home	1
No fixed workplace address	1

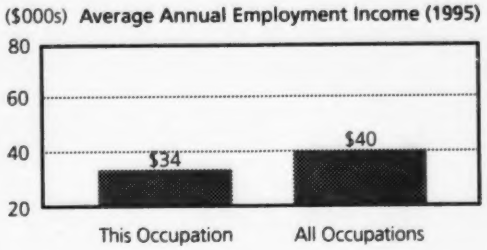
Employment by Region

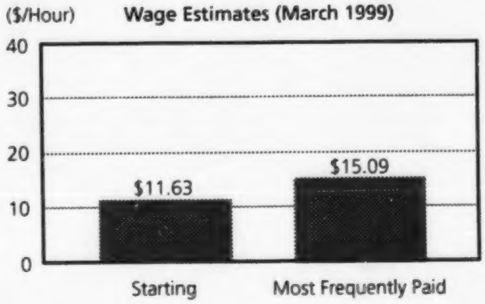
	(%) This Occupation	*(%) All Occupations*
Ottawa	2	10
Kingston-Pembroke	2	4
Muskoka-Kawarthas	2	3
Kitchener-Waterloo-Barrie	21	9
Hamilton-Niagara Peninsula	15	11
Toronto	35	42
London	6	5
Windsor-Sarnia	12	5
Stratford-Bruce Peninsula	3	3
Northeast	1	5
Northwest	0	2

Main Industries of Employment

	(%)
Transportation equipment	38
Fabricated metal products	29
Primary metals	10
Machinery	7

Income and Wages





For more information
Metal World (www.metalworld.com)

Appendices

Appendix A – How Jobs Get Defined

Introduction

Open up any daily newspaper and turn to the "Jobs Classified" or "Help Wanted" section and you will find hundreds of job ads. These are ads placed by employers for job openings. Just as there are many different types of employers (e.g., retail stores, autobody shops, Internet providers) there are as many, if not more, types of jobs (e.g., cashiers, inventory clerks, mechanics, brake specialists, systems analysts, programmers, marketers). In fact, there are tens of thousands of different types of jobs in the Ontario labour market. Many of these jobs are quite different from one another; for example, there is a distinct difference between a nurse and a truck driver. On the other hand, there are jobs that share many similar attributes – saucier, sous-chef, patissier and pasta chef are all chefs. The goal of a classification system is to group similar occupations together in a manner that clearly highlights the distinctiveness of that group. The **N**ational **O**ccupational **C**lassification system, or NOC, does exactly this by grouping occupations according to their skill level and skill type.

For the NOC a large research project was undertaken by Human Resources Development Canada (formerly Employment and Immigration Canada). Firms in all areas of Canada's economy were surveyed to collect information on their jobs, industry studies were undertaken, professional associations were contacted, and specialists in analysis and classification of jobs were employed.

The term "occupation" is used in the title of the Classification rather than job because the occupation titles refer to types of work that are found in groups of families of closely related jobs that have similar education and training requirements, hence the use of the term occupation. This can be illustrated with the occupation "computer programmers". In the Classification, the following examples of titles are assigned to this occupation: application programmer, business programmer, computer programmer, operating system programmer, programmer analyst, scientific programmer, software programmer and system programmer. In all, there are 522 occupational groups and approximately 25,000 titles covered by the NOC.

Skill level is defined as the amount and type of education required to perform the duties of the job, and *skill type* is defined as the type of work performed. In developing the classification, the fact that jobs of a particular type are concentrated in certain parts of the economy has also been taken into account.

What is an Occupational Skill Level?

All employers expect that a new employee will have the appropriate level of schooling and/or work experience needed to do the job. Occupations can be grouped according to what most employers hold as the minimum skill level needed for an occupation. For example, an "accountant" is generally required to have a higher level of schooling than a "bookkeeper". The table below categorizes four broad skill levels used to classify all NOC occupations.

NOC Skill Level Criteria

Skill Level	Education/Training	Other
A	• University degree (bachelor's, master's or post-graduate)	
B	• Two to three years of post-secondary education at community college or institute of technology *(or)* • Two to four years of apprenticeship training *(or)* • Three to four years of secondary school and more than two years of on-the-job training, training course or specific work experience	• Occupations with supervisory responsibilities are assigned to skill level B. • Occupations with significant health and safety responsibilities (e.g., fire fighters, police officers and registered nursing assistants) are assigned to skill level B.
C	• One to four years of secondary school education • Up to two years of on-the-job training, training courses or specific work experience	
D	• Up to two years of secondary school and short work demonstration or on-the-job training	

In the example above, an accountant would be classified with a skill level "A" and a bookkeeper with a skill level "B".

An *exception* to this rule occurs among managerial occupations, which are not assigned a skill level since the criteria for hiring managers and senior executives often includes other non-schooling/training factors such as some particular type of experience.

What is an Occupational Skill Type?

Many occupations share similar work tasks, as in our previous example of accountants and bookkeepers, who both work with numbers that represent expenses, revenues, etc. Grouping occupations by the type of work performed is done by assigning a skill type.

In the case of accountants and bookkeepers, the corresponding skill type is "Business, Finance and Administration". Below is a list of the ten skill types defined in the NOC system.

0. **Management Occupations** – The skill type category contains legislators, senior management occupations and middle and other management occupations.
1. **Business, Finance and Administration** – This category contains occupations that are concerned with supervising and providing financial and business services, administrative and regulatory services and clerical support services. Some occupations in this category are unique to financial and business service industries; most are found in all industries.
2. **Natural and Applied Sciences and Related Occupations** – This category contains professional and technical occupations in the sciences, including physical and life sciences, engineering and architecture.
3. **Health Occupations** – This category includes occupations concerned with providing health care services directly to patients and occupations that provide support to professional and technical staff.
4. **Occupations in Social Science, Education, Government Services and Religion** – This skill type category includes a range of occupations that are concerned with law, teaching, counselling, conducting social science research, developing government policy and administering government and other programs.
5. **Occupations in Art, Culture, Recreation and Sport** – This skill type category includes professional and technical occupations related to art and culture, including the performing arts, film and video, broadcasting, journalism, writing, creative design, libraries and museums. It also includes occupations in recreation and sport.
6. **Sales and Service** – This skill type category contains sales occupations, personal and protective service occupations and occupations related to the hospitality and tourism industries.
7. **Trades, Transport and Equipment Operators and Related Occupations** – This skill type category includes construction and mechanical trades, trades supervisors and contractors and operators of transportation and heavy equipment. These occupations are found in a wide range of industry sectors, with many occurring in the construction and transportation industries.
8. **Occupations Unique to Primary Industry** – This category contains non-technical occupations in mining, oil and gas production, forestry and logging, agriculture, horticulture and fishing.
9. **Occupations Unique to Processing, Manufacturing and Utilities** – This category contains supervisory and production occupations in manufacturing, processing and utilities.

Piecing the NOC Code Together

The NOC system is based on categorizing occupations by their evaluated skill level and skill type. Each NOC code consists of four digits. The first digit denotes the occupation's skill type; the second denotes the occupation's skill level. Combined, these two digits define the NOC "Major Group" for all occupations with the same skill level and skill type. The final two digits are employed to narrow, or "drill down", to a specific occupational group. The third digit, combined with the "Major Group", defines the "Minor Group". The fourth digit identifies even further the specific occupation within the "Minor Group", referred to as the NOC "Unit Group".

Dissecting the NOC Coding System

Example: NOC Code 1242, Legal Secretaries

1

The first digit represents the skill type. In this example it is skill type 1 – Business, Finance and Administration.

2

The second digit represents the skill level according to the following formula:

The character 1	• Skill Level A
The characters 2 and 3	• Skill Level B
The characters 4 and 5	• Skill Level C
The character 6	• Skill Level D

Combined, the skill level and skill type form the "Major Group" for all occupations having the same skill level and skill type. For the above example, the "Major Group" is: Skilled Administrative and Business Occupations.

4

The final two digits are employed to narrow, or drill down, to a specific occupational group. In the above case, the third digit combined with the skill type and skill level forms the "Minor Group": Secretaries, Recorders and Transcriptionists.

2

The final digit completes the coding sequences by forming a "Unit group" – the most detailed group provided under the NOC four digit coding system. In the above example this is: Legal Secretaries.

As mentioned earlier, an *exception* to this rule occurs among managerial occupations (skill type 0 – Management Occupations), which are not assigned a skill level since the criteria for hiring managers and senior executives often includes other non-schooling/training factors such as some particular type of experience.

What is the Skill Level for Occupations Presented in the Ontario Job Futures 2000?

What follows is a list of occupations grouped by skill level, as defined by the National Occupational Classification system. Each skill level represents a combination of educational attainment, training and/or job experience that most employers expected a person in that job to have. Within each skill level, NOC Unit Groups are organised by skill type.

Management Occupations

Education/Training: Combination of job and industry experience.

- Banking, Credit and Other Investment Managers (0122)
- Construction Managers (0711)
- Financial Managers (0111)
- Human Resources Managers (0112)
- Information Systems and Data Processing Managers (0213)
- Insurance, Real Estate and Financial Brokerage (0121)
- Managers in Health Care (0311)
- Manufacturing Managers (0911)
- Purchasing Managers (0113)
- Residential Home Builders and Renovators (0712)
- Restaurant and Food Service Managers (0631)
- Retail Trade Managers (0621)
- Sales, Marketing and Advertising Managers (0611)

Skill Level A

Education/Training: University degree (bachelor's, master's or post-graduate)

Business, Finance and Administration
- Financial and Investment Analysts (1112)
- Financial Auditors and Accountants (1111)
- Securities Agents, Investment Dealers and Traders (1113)
- Specialists in Human Resources (1121)

Natural and Applied Sciences
- Aerospace Engineers (2146)
- Architects (2151)
- Biologists and Related Scientists (2121)
- Chemical Engineers (2134)
- Chemists (2112)
- Civil Engineers (2131)

Skill Level A (cont'd)

- Computer Engineers (2147)
- Computer Programmers (2163)
- Computer Systems Analysts (2162)
- Electrical and Electronics Engineers (2133)
- Geologists, Geochemists and Geophysicists (2113)
- Industrial and Manufacturing Engineers (2141)
- Mathematicians, Statisticians and Actuaries (2161)
- Mechanical Engineers (2132)
- Urban and Land Use Planners (2153)

Health

- Audiologists and Speech-Language Pathologists (3141)
- Chiropractors (3122)
- Dentists (3113)
- General Practitioners and Family Physicians (3112)
- Occupational Therapists (3143)
- Optometrists (3121)
- Pharmacists (3131)
- Physiotherapists (3142)
- Registered Nurses (3152)
- Specialist Physicians (3111)
- Veterinarians (3114)

Social Science, Education, Government Service and Religion

- Economists and Economic Policy Researchers and Analysts (4162)
- Elementary School and Kindergarten Teachers (4142)
- Lawyers (4112)
- Psychologists (4151)
- School and Guidance Counsellors (4143)
- Secondary School Teachers (4141)
- Social Workers (4152)

Art, Culture, Recreation and Sport

- Editors (5122)
- Journalists (5123)
- Librarians (5111)
- Professional Occupations in Public Relations and Communications (5124)
- Translators, Terminologists and Interpreters (5125)
- Writers (5121)

Skill Level B

Education/Training: Two to three years of post-secondary education at community college or institute of technology; or, two to four years of apprenticeship training; or three to four years of secondary school and more than two years of on-the-job training, training course or specific work experience. Occupations with supervisory responsibilities are assigned to skill level B; or, occupations with significant health and safety responsibilities (e.g., fire fighters, police officers and registered nursing assistants) are assigned to skill level B.

Business, Finance and Administration

- Administrative Officers (1221)
- Bookkeepers (1231)
- Executive Assistants (1222)
- Insurance Adjusters and Claims Examiners (1233)
- Insurance Underwriters (1234)
- Legal Secretaries (1242)
- Medical Secretaries (1243)
- Property Administrators (1224)
- Purchasing Agents and Officers (1225)
- Secretaries (Except Legal and Medical) (1241)

Natural and Applied Sciences

- Air Pilots, Flight Engineers and Flying Instructors (2271)
- Aircraft Instrument, Electrical and Avionics Mechanics (2244)
- Applied Chemical Technologists and Technicians (2211)
- Architectural Technologists and Technicians (2251)
- Biological Technologists and Technicians (2221)
- Civil Engineering Technologists and Technicians and Construction Estimators (2230)
- Drafting Technologists and Technicians (2253)
- Electrical and Electronics Engineering Technologists and Technicians (2241)
- Electronic Service Technicians (Household and Business Equipment) (2242)
- Forestry Technologists and Technicians (2223)
- Industrial Designers (2252)
- Industrial Engineering and Manufacturing Technologists (2233)
- Industrial Instrument Technicians and Mechanics (2243)
- Mechanical Engineering Technologists and Technicians (2232)
- Survey Technologists and Technicians (2254)

Health

- Ambulance Attendants and Other Paramedical Occupations (3234)
- Medical Laboratory Technicians (3212)
- Medical Laboratory Technologists and Pathologists' Assistants (3211)

Skill Level B (cont'd)

- Medical Radiation Technologists (3215)
- Registered Practical Nurses (3233)
- Respiratory Therapists and Clinical Perfusionists (3214)

Social Science, Education, Government Service and Religion

- Community and Social Service Workers (4212)
- Paralegal and Related Occupations (4211)

Art, Culture, Recreation and Sport

- Audio and Video Recording Technicians (5225)
- Graphic Arts Technicians (5223)
- Graphic Designers and Illustrating Artists (5241)
- Interior Designers (5242)
- Other Technical Occupations in Motion Picture Broadcasting & Performing Arts (5226)

Sales and Service

- Bakers (6252)
- Butchers and Meat Cutters, Retail and Wholesale (6251)
- Chefs (6241)
- Cooks (6242)
- Hairstylists and Barbers (6271)
- Insurance Agents and Brokers (6231)
- Real Estate Agents and Salespersons (6232)
- Retail and Wholesale Buyers (6233)
- Technical Sales Specialists, Wholesale Trade (6221)

Trades, Transport and Equipment Operators

- Aircraft Mechanics and Aircraft Inspectors (7315)
- Bricklayers (7281)
- Cabinetmakers (7272)
- Carpenters (7271)
- Construction Millwrights and Industrial Mechanics (Except Textile) (7311)
- Crane Operators (7371)
- Electric Appliance Servicers and Repairers (7332)
- Electrical Power Line and Cable Workers (7244)
- Electricians (Except Industrial and Power System) (7241)
- Heavy-Duty Equipment Mechanics (7312)
- Industrial Electricians (7242)
- Machinists and Machining and Tooling Inspectors (7231)
- Motor Vehicle Body Repairers (7322)

Skill Level B (cont'd)

- Motor Vehicle Mechanics, Technicians and Mechanical Repairers (7321)
- Plumbers (7251)
- Refrigeration and Air Conditioning Mechanics (7313)
- Sheet Metal Workers (7261)
- Stationary Engineers and Auxiliary Equipment Operators (7351)
- Steamfitters, Pipefitters and Sprinkler System Installers (7252)
- Telecommunications Installation and Repair Workers (7246)
- Tool and Die Makers (7232)

Primary Industry

- Farmers and Farm Managers (8251)
- Landscaping and Grounds Maintenance Contractors Managers (8255)
- Nursery and Greenhouse Operators and Managers (8254)

Processing, Manufacturing and Utilities

- Papermaking and Coating Control Operators (9234)

Skill Level C

Education/Training: One to four years of secondary school education and up to two years of on-the-job training, training courses or specific work experience

Business, Finance and Administration

- Accounting and Related Clerks (1431)
- Administrative Clerks (1441)
- Computer Operators (1421)
- Customer Service, Information and Related Clerks (1453)
- General Office Clerks (1411)
- Production Clerks (1473)
- Purchasing and Inventory Clerks (1474)
- Receptionists and Switchboard Operators (1414)
- Shippers and Receivers (1471)
- Tellers, Financial Services (1433)

Health

- Dental Assistants (3411)
- Nurse Aides and Orderlies (3413)

Sales and Service

- Early Childhood Educators and Assistants (6470)
- Elementary and Secondary School Teacher Assistants (6472)

Skill Level C (cont'd)

- Food and Beverage Servers (6453)
- Retail Salespersons and Sales Clerks (6421)
- Travel Counsellors (6431)
- Visiting Homemakers, Housekeepers and Related Occupations (6471)

Trades, Transport and Equipment Operators

- Heavy Equipment Operators (Except Crane) (7421)
- Truck Drivers (7411)

Processing, Manufacturing and Utilities

- Aircraft Assemblers and Aircraft Assembly Inspectors (9481)
- Assemblers and Inspectors, Electrical Appliance, Apparatus and Equipment Manufacturing (9484)
- Electronics Assemblers, Fabricators, Inspectors and Testers (9483)
- Machining Tool Operators (9511)
- Metalworking Machine Operators (9514)
- Motor Vehicle Assemblers, Inspectors and Testers (9482)
- Plastics Processing Machine Operators (9422)
- Sewing Machine Operators (9451)
- Welders and Soldering Machine Operators (9510)

For Additional Information

For more information about the National Occupational Classification system visit the NOC web site at (http://www.worklogic.com:81/noc).

Appendix B – Useful Web Sites

Name of Organization	Web Site Address	Description of Site
Association of College of Applied Arts & Technology of Ontario	**www.acaato.on.ca**	An advocacy and marketing association of the 25 Colleges of Applied Arts and Technology of Ontario. Its mandate is to advance a strong college system for Ontario.
Association of College of Applied Arts & Technology of Ontario *Key Performance Indicators (KPI)*	**www.acaato.on.ca/kpi**	Measures how well Ontario colleges meet the needs of students and the marketplace and lets students, colleges, the Government and the Ontario public know how employers, students and graduates feel about college programs and their relevance to today's working world.
Canada Workinfo Net	**www.workinfonet.ca**	Helps Canadians connect to the resources they need in the areas of jobs, work and recruiting; learning, education and training; occupations and careers; labour market information and outlook; self-employment; workplace issues and supports; and financial help and issues.
CanLearn Interactive	**www.canlearn.ca**	A comprehensive bilingual resource for learning information, products and services to support Canadians in pursuit of learning and career goals.

x/

Name of Organization	Web Site Address	Description of Site
Human Resources Development Canada	**www.hrdc-drhc.gc.ca**	Helps Canadians prepare for, find and keep work; assists in their efforts to provide financial security (e.g., Employment Insurance, Canada Student Loans) for themselves and their families; and promotes a fair, safe, healthy, stable, cooperative and productive work environment.
Human Resources Development Canada *Interactive Training Inventory*	**www.trainingiti.com**	An online database with information on thousands of courses, programs, seminars and workshops.
Human Resources Development Canada *Job Futures (National)*	**www.hrdc-drhc.gc.ca/JobFutures**	Provides Canadians with information about the current world of work and projections for the future.
Human Resources Development Canada *National Occupations Classifications*	**www.hrdc-drhc.gc.ca./noc**	A tool for helping Canadians to understand the world of work. It describes duties, skills, interests, aptitudes, education requirements and working settings for occupations in the Canadian labour market.
Human Resources Development Canada *Ontario Wage Survey*	**www.on.hrdc-drhc.gc.ca/english/lmi/eaid/OWS99**	A comprehensive review of wages paid to workers in 215 different occupations by 15,316 Ontario businesses.
Human Resources Development Canada and the Scadding Court Community Centre *Workwaves*	**www.workwaves.com**	Dedicated to providing the community with the latest information about the Advertised Job Market in the Greater Toronto area.

Name of Organization	Web Site Address	Description of Site
Ontario Colleges Application Centre	**www.ocas.on.ca**	Provides administrative systems and application processing services for Ontario's 25 Colleges of Applied Arts and Technology, 3 Agricultural Colleges and The Michener Institute for Applied Health Sciences.
Ontario Ministry of Training, Colleges and Universities	**www.edu.gov.on.ca/eng/ training/ training.html**	Provides information on the programs supported by the Training Division within the Ministry.
Ontario Ministry of Training, Colleges and Universities *Career Gateways*	**www.edu.gov.on.ca/eng/ career**	Provides a starting point for exploration of many online career- and employment-related resources.
Ontario Universities Application Centre	**www.ouac.on.ca**	Central bureau whose key functions is the processing of applications to the province's 17 universities and Ontario College of Art and Design.
Ontario WorkInfoNet (OnWIN)	**www.on.workinfonet.ca**	Provides employment and career information over the Internet and specializes in providing links to work- and career-related Web sites in Ontario.
The Node Learning Technologies Network	**www.thenode.org**	Promotes effective uses of Internet-based technologies in education and training.

Appendix C – Alphabetical Listing of Occupational Profiles

NOC Code	Title	Page
1431	Accounting and Related Clerks	80
1441	Administrative Clerks	84
1221	Administrative Officers	54
2146	Aerospace Engineers	110
2271	Air Pilots, Flight Engineers and Flying Instructors	152
9481	Aircraft Assemblers and Aircraft Assembly Inspectors	320
2244	Aircraft Instrument, Electrical and Avionics Mechanics, Technicians and Inspectors	142
7315	Aircraft Mechanics and Aircraft Inspectors	292
3234	Ambulance Attendants and Other Paramedical Occupations	186
2211	Applied Chemical Technologists and Technicians	124
2151	Architects	114
2251	Architectural Technologists and Technicians	144
9484	Assemblers and Inspectors, Electrical Appliance, Apparatus and Equipment Manufacturing	326
5225	Audio and Video Recording Technicians	224
3141	Audiologists and Speech-Language Pathologists	168
6252	Bakers	246
0122	Banking, Credit and Other Investment Managers	28
2221	Biological Technologists and Technicians	126
2121	Biologists and Related Scientists	98
1231	Bookkeepers	62
7281	Bricklayers	284
6251	Butchers and Meat Cutters, Retail and Wholesale	244
7272	Cabinetmakers	282
7271	Carpenters	280
6241	Chefs	240
2134	Chemical Engineers	106
2112	Chemists	94
3122	Chiropractors	164
2230	Civil Engineering Technologists and Technicians and Construction Estimators	130
2131	Civil Engineers	100
4212	Community and Social Service Workers	208
2147	Computer Engineers	112
1421	Computer Operators	78

NOC Code	Title	Page
2163	Computer Programmers	122
2162	Computer Systems Analysts	120
0711	Construction Managers	40
7311	Construction Millwrights and Industrial Mechanics (Except Textile)	286
6242	Cooks	242
7371	Crane Operators	302
1453	Customer Service, Information and Related Clerks	86
3411	Dental Assistants	188
3113	Dentists	158
2253	Drafting Technologists and Technicians	148
6470	Early Childhood Educators and Assistants	256
4162	Economists and Economic Policy Researchers and Analysts	204
5122	Editors	214
7332	Electric Appliance Servicers and Repairers	298
2241	Electrical and Electronics Engineering Technologists and Technicians	136
2133	Electrical and Electronics Engineers	104
7244	Electrical Power Line and Cable Workers	270
7241	Electricians (Except Industrial and Power System)	266
2242	Electronic Service Technicians (Household and Business Equipment)	138
9483	Electronics Assemblers, Fabricators, Inspectors and Testers	324
4142	Elementary School and Kindergarten Teachers	196
6472	Elementary and Secondary School Teacher Assistants	260
1222	Executive Assistants	56
8251	Farmers and Farm Managers	308
1111	Financial Auditors and Accountants	46
1112	Financial and Investment Analysts	48
0111	Financial Managers	20
6453	Food and Beverage Servers	254
2223	Forestry Technologists and Technicians	128
1411	General Office Clerks	74
3112	General Practitioners and Family Physicians	156
2113	Geologists, Geochemists and Geophysicists	96
5223	Graphic Arts Technicians	222
5241	Graphic Designers and Illustrating Artists	228

NOC Code	Title	Page
6271	Hairstylists and Barbers	248
7421	Heavy Equipment Operators (Except Crane)	306
7312	Heavy-Duty Equipment Mechanics	288
0112	Human Resources Managers	22
2252	Industrial Designers	146
7242	Industrial Electricians	268
2233	Industrial Engineering and Manufacturing Technologists and Technicians	134
2243	Industrial Instrument Technicians and Mechanics	140
2141	Industrial and Manufacturing Engineers	108
0213	Information Systems and Data Processing Managers	30
1233	Insurance Adjusters and Claims Examiners	64
6231	Insurance Agents and Brokers	234
0121	Insurance, Real Estate and Financial Brokerage Managers	26
1234	Insurance Underwriters	66
5242	Interior Designer	230
5123	Journalists	216
8255	Landscaping and Grounds Maintenance Contractors and Managers	312
4112	Lawyers	192
1242	Legal Secretaries	70
5111	Librarians	210
9511	Machining Tool Operators	330
7231	Machinists and Machining and Tooling Inspectors	262
0311	Managers in Health Care	32
0911	Manufacturing Managers	44
2161	Mathematicians, Statisticians and Actuaries	118
2232	Mechanical Engineering Technologists and Technicians	132
2132	Mechanical Engineers	102
3212	Medical Laboratory Technicians	178
3211	Medical Laboratory Technologists and Pathologists' Assistants	176
3215	Medical Radiation Technologists	182
1243	Medical Secretaries	72
9514	Metalworking Machine Operators	332
9482	Motor Vehicle Assemblers, Inspectors and Testers	322
7322	Motor Vehicle Body Repairers	296
7321	Motor Vehicle Mechanics, Technicians and Mechanical Repairers	294

NOC Code	Title	Page
3413	Nurse Aides and Orderlies	190
8254	Nursery and Greenhouse Operators and Managers	310
3143	Occupational Therapists	172
3121	Optometrists	162
9234	Papermaking and Coating Control Operators	314
4211	Paralegal and Related Occupations	206
3131	Pharmacists	166
3142	Physiotherapists	170
9422	Plastics Processing Machine Operators	316
7251	Plumbers	274
1473	Production Clerks	90
1224	Property Administrators	58
4151	Psychologists	200
5124	Public Relations and Communications, Professional Occupations in	218
1225	Purchasing Agents and Officers	60
1474	Purchasing and Inventory Clerks	92
0113	Purchasing Managers	24
6232	Real Estate Agents and Salespersons	236
1414	Receptionists and Switchboard Operators	76
7313	Refrigeration and Air Conditioning Mechanics	290
3152	Registered Nurses	174
3233	Registered Practical Nurses	184
0712	Residential Home Builders and Renovators	42
3214	Respiratory Therapists and Clinical Perfusionists	180
0631	Restaurant and Food Service Managers	38
6421	Retail Salespersons and Sales Clerks	250
0621	Retail Trade Managers	36
6233	Retail and Wholesale Buyers	238
0611	Sales, Marketing and Advertising Managers	34
4143	School and Guidance Counsellors	198
4141	Secondary School Teachers	194
1241	Secretaries (Except Legal and Medical)	68
1113	Securities Agents, Investment Dealers and Traders	50
9451	Sewing Machine Operators	318
7261	Sheet Metal Workers	278
1471	Shippers and Receivers	88

NOC Code	Title	Page
4152	Social Workers	202
3111	Specialist Physicians	154
1121	Specialists in Human Resources	52
7351	Stationary Engineers and Auxiliary Equipment Operators	300
7252	Steamfitters, Pipefitters and Sprinkler System Installers	276
2254	Survey Technologists and Technicians	150
5226	Technical Occupations in Motion Pictures, Broadcasting and the Performing Arts, Other	226
6221	Technical Sales Specialists, Wholesale Trade	232
7246	Telecommunications Installation and Repair Workers	272
1433	Tellers, Financial Services	82
7232	Tool and Die Makers	264
5125	Translators, Terminologists and Interpreters	220
6431	Travel Counsellors	252
7411	Truck Drivers	304
2153	Urban and Land Use Planners	116
3114	Veterinarians	160
6471	Visiting Homemakers, Housekeepers and Related Occupations	258
9510	Welders and Soldering Machine Operators	328
5121	Writers	212

ISBN 0-7794-0021-6